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INFLAMMATIONS OF THE EYEBALL.

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A TREATISE

ON THE

INFLAMMATIONS OF THE EYEBALL;

INCLUDING THE

IDIOPATHIC, SCROFULOUS, RHEUMATIC, ARTHRITIC,
SYPHILITIC, GONORRHOEAL, POST-FEBRILE, SYMPATHETIC,
PHLEBITIC, AND NEURALGIC SPECIES OR VARIETIES :

TOGETHER WITH THE

CIRCUMSCRIBED INFLAMMATIONS, OF THE CORNEA, CHAMBER
OF AQUEOUS HUMOUR, CRYSTALLINE LENS, CHOROID
MEMBRANE, AND RETINA ; AND INFLAMMATION OF THE EYE
FROM INJURY.

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PREFACE.

THE following treatise was published in the shape of detached essays in the DUBLIN MEDICAL PRESS during the last two years, and when so published was arranged for printing in the present form. My object was not to supply a mere ephemeral sketch of extant information on this subject, but to provide a digested summary for the permanent use of students and practitioners. The statements and observations which I have made on my own authority are the result of a very long practice in this department of surgery; and these which I have made on the authority of others have been carefully selected from the best sources within my reach. I offer the work as an introduction to the study of Diseases of the Eye, believing that inflammation and its consequences constitute the largest proportion of these maladies; and I address it more to physicians and surgeons in general practice, and to students, than to those more exclusively devoted to this branch of the healing art. This I do because I think that the study of these diseases should be restored to its original conspicuous place amongst the most favoured topics of medical instruction, rather than abandoned to a more limited cultivation. It may not be prudent to say so, but I cannot refrain from observing that the more diseases of the eye have been engrossed by persons laying claim to their special treatment, the less have they partaken of the general improvement which time has effected in medicine and surgery. It cannot, I think, be denied that physicians and surgeons having neglected the subject from a belief that it was under the particular consideration of others, became less familiar with it; and now when they would resume it, are less competent to do justice to its merits. I know that they will not admit the

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truth of this observation, and that many of them will consider it unjust ; but I venture to make it, because I believe that the sooner its correctness is established the sooner will the defect it indicates be repaired. I do not, however, mean to say that diseases of the eye have not had their due share of attention from surgical writers ; on the contrary, I consider that no department has been more favoured ; what I wish to inculcate is, that practitioners in general have not paid that attention to the subject which its importance demands, and which is necessary to give weight to their claims to an acquaintance with it.

If the diffusion of correct information respecting diseases of the eye has been obstructed or postponed from the causes to which I allude, it has also perhaps been retarded by the superfluous labours of those who assert an exclusive claim to a knowledge of them. By attaching an undue importance to trifles, giving currency to elaborate nosological refinements, and adopting a barbarous and pedantic nomenclature, the more zealous cultivators of ophthalmic surgery have often involved simple truths and obvious facts in obscurity, and have by so doing created difficulties which a more simple and enlightened treatment of the subject does not present. In the following pages I have endeavoured to keep these considerations in view, restricting my observations and inquiries to the investigation of the structure of the parts engaged, the changes caused by inflammatory action, and the treatment to be adopted ; avoiding as much as possible controversial topics and historical details. I have also endeavoured to render the statements intelligible to the most inexperienced readers by the use of plain and homely language, and by avoiding technical terms and medical phraseology. For practitioners who may think the work worth consulting, I have provided a table of contents and an index : students I advise either to read it through or to leave it untouched.

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DISEASES OF THE EYE.

INFLAMMATION OF THE EYEBALL.

INFLAMMATION of the eye is now very generally called iritis, and the invention or application of this term has been looked upon as an improvement in the nomenclature of disease, if not somewhat of a discovery or novelty: yet no one I believe ever saw the iris inflamed without corresponding inflammation of the sclerotic, and seldom without inflammation of other parts of the organ. I am also sure that no one ever saw inflammation of the iris proceed unchecked until it terminated in blindness, who did not at the same time see that the disease had extended to the retina, the crystalline lens and its capsule, the membrane lining the chamber of the aqueous humour, and probably to the choroid and vitreous humour. I do not mean to say that what is called iritis, when it terminates in blindness, is always accompanied or followed by opacity of the lens, or disorganization of the vitreous humour; because we often in such cases see the lens remaining transparent, and find the vitreous humour firm; but I do mean to say that the consequences of iritis are rarely, if ever, confined to that particular part, but extend to one or more of the other textures. I would therefore, with the greatest respect for the opinions of eminent men who have written on this subject, suggest

that the term should be abandoned as mischievous and calculated to lead inexperienced persons astray, by fastening their attention on the iris when the retina should be the prominent object. I am not disputing about a mere word, but endeavouring to correct what I consider a mistake having an injurious effect in practice. I want the practitioner to recollect that when he sees the sclerotic red, and the iris discoloured, he has not to contend with inflammation of the iris only, but with inflammation of the whole eyeball, and above all, with inflammation of the retina. I would even go farther and express my conviction that the attempt to insulate or to confine the inflammations of the eye to particular structures under the names of iritis, choroiditis, retinitis, corneitis, sclerotitis, aquo-capsulitis, and hyaloiditis, has not proved serviceable in practice. It looks very methodical, and appears plausible and accurate in books and lectures, but when we come to test the matter by observation we find many of these apparent distinctions vanish, and discover that it is only a progressive inflammation of the whole organ, more conspicuous at the commencement, in some particular part. Inflammation of the retina, I admit, often terminates in blindness without apparently implicating other structures, and I shall have hereafter to dwell upon that important fact: inflammation of the cornea also often proceeds for a length of time without engaging any other part than the sclerotic; but both, frequently, if not generally, when unchecked, extend to the other parts of the eye, and ultimately disorganize the whole. I find it urged as an argument in favour of the view that the iris undergoes inflammation without corresponding inflammation of the other parts of the eye, that when vision is lost by closure of the pupil in iritis, the formation of an artificial pupil will often restore it; but my experience leads me to a different conclusion, for, as I shall have to state hereafter.

I find that the operation for artificial pupil in such cases is generally useless, because the so-called iritis has been accompanied by inflammation of the retina terminating in blindness or amaurosis. That the iris should have been considered the principal, if not the only part particularly engaged in inflammation of the eye, is not to be wondered at, because it is the most conspicuous and remarkable object of the whole, and the changes it undergoes from disease are the most visible and peculiar. In fact, the whole body does not afford such an other opportunity of observing the progress of disease under the most favourable circumstances as does the iris, placed as it is behind the transparent lenticular cornea, and expanded, as we find it, in a chamber filled with transparent fluid. In it we see the effects of the inflammation from beginning to end, and from its great vascularity, peculiar functions, and remarkable colour, we see these effects presenting greater variety and of more distinct appearance; but then let it never be forgotten that we also see the effects of the inflammation in all the exposed or visible parts of the organ. The sclerotic is as red as inflammation can make it, and the cornea exhibits that loss of transparency, which is the first effect of acute inflammation on transparent structures, in the shape of a gray ring encircling its margin. Neither the choroid, retina, or vitreous humour can be seen, but the loss or imperfection of vision proves that one or all of them are implicated; and the frequency of opacity of the lens, where the eye is destroyed, proves that it also partakes of the general mischief. I have perhaps dwelt longer than may seem necessary on this point, but I have done so because I consider that the first step towards the successful treatment of inflammation of the eyeball is to become convinced that it is not a mere *iritis*, but a general inflammation of the whole organ, terminating, if unchecked, in its destruction, and consequently in blindness.

Inflammation of the eyeball is, or appears to be, or is supposed to be, so much modified and influenced by constitutional disease in its symptoms, progress, and consequences, that we now hear of little else than rheumatic, arthritic, syphilitic, or serofulous *iritis*. Simple uncomplicated inflammation of the eyeball, or, as it has been called, idiopathic *iritis*, is, one might be led to suppose, seldom to be met with; and yet it is I think of more frequent occurrence than is generally believed. Nothing is more common than to find a practitioner assuming that an inflammation of the eye is of a rheumatic character, because he finds on close examination that his patient has sometimes had pains in some of his muscles or joints; or that it is from gout, because his father or grandfather suffered from that disease; or that it is serofulous, because it is a little tedious, and occurs in a person of delicate frame. Simple inflammation of the eye, however, is not only of frequent occurrence, but I am inclined to think is the most common form; in Ireland at least. Of the poor who come to me from all parts of the country with the hope of having sight restored, I find that the greater number by far have been blinded by simple inflammation. With them gout is out of the question, serofula, if present, is visible, and true rheumatism is easily recognized. The simple uncomplicated nature of the inflammation which destroyed the organ can therefore scarcely be doubted. Whether this is the case in other countries or not, I cannot tell, but I should not be surprised to find that it is more or less peculiar to Ireland, because the circumstances under which the poorer portion of our population are placed are peculiar. Badly fed, imperfectly clothed, and miserably lodged, in a cold and damp climate, while exposed to great vicissitudes of temperature and moisture, they encounter every remote cause likely to produce acute inflammations, and from these the eye cannot be exempt. I am so

convinced of this that I strongly recommend the study of this form of disease to the Irish student and practitioner, being satisfied that greater attention to it in the earlier stages will save many from blindness who might not otherwise escape. It will require some attention to persuade the Irish peasant to submit to proper treatment, for I find that they generally allow the first symptoms to proceed without seeking relief; and the disease being often insidious in its approaches, and varying in its progress, the organ is destroyed before application is made to the surgeon. Even in private practice the practitioner will often find the patient unwilling to submit to the necessary treatment and restraint until the disease has made so much progress that the loss of vision alarms him, by which the opportunity for arresting the disease at its commencement is lost, and the danger greatly increased.

SYMPTOMS OF ACUTE INFLAMMATION OF THE EYEBALL.

IN all inflammations of the eyeball, whether modified by constitutional disease, or simple and uncomplicated, there are certain symptoms or appearances which unequivocally indicate the existence of the disease. Some may be more and some less obvious, but there is always enough to distinguish the affection of the eye from that of the conjunctiva which covers it. The inflammatory action is plainly visible in the sclerotic, cornea, membrane of the aqueous humour, iris, and lens; and the existence of it in the retina, choroid, and vitreous humour may with certainty be inferred from the imperfection of sight, as well as from analogy and the final disorganization of the whole, when neglected or mismanaged. The practitioner is not, however, to expect to see all the symptoms or changes well marked in all cases. In some, one structure; in others a different one, suffers more: sometimes it is the iris,

sometimes the retina which is most severely attacked, but in all cases of acute inflammation of the eye the sclerotic exhibits increased vascularity, and that of so peculiar a nature that it has long been considered characteristic of the disease, and is always noticed as one of the most remarkable symptoms in descriptions of *iritis*. The vessels of the sclerotic are described as converging towards the cornea, and forming a pink zone surrounding its margin; and this description is correct. The arteries which supply the anterior part of the sclerotic enter it at some distance from the cornea, and then ramify towards its edge, and consequently converge in that direction in their course. This is a necessary consequence of the spherical form of the organ and the circular form of the cornea, and hence the peculiar radiating or converging lines of vessels so different from the areolar arrangement observed in inflammation of the conjunctiva. These converging vessels, however, having approached the margin of the cornea, become more minute and numerous, until at length they become invisible to the naked eye as distinct vessels, and merely present the appearance of a red circle in the sclerotic round the margin of the cornea; and this it is which has been always alluded to as the characteristic pink zone of *iritis*. But not only are the converging vessels and pink zone characteristic, but so also is the colour. The inflammatory vascularity, instead of presenting the dull red of venous distribution, as it does in conjunctival or other inflammation, exhibits the bright pink or scarlet tint of arterial blood, and hence the allusion to this difference in colour as a characteristic symptom: and this is sometimes so remarkable that in younger persons where the sclerotic is white and clear, the existence of this inflamed condition may be predicted from the bright red appearance of the eye, seen from a considerable distance. Let it, then, be recollected that inflammation of the eye, as displayed in

the sclerotic, exhibits this bright red vascularity composed of these converging vessels and the pink zone round the cornea.

The next part to which attention should be directed is the cornea; but here we have not, in the acute or early stage of the inflammation at least, such marked appearances of inflammatory action; the structure containing no visible vessels, and not being liable to any very remarkable change at this period. As increase of size in vessels appears to be the first effect of inflammation in highly vascular parts, so does loss of transparency appear to be the effect in parts receiving no red blood in the ordinary state. The crystalline lens and the membrane of the aqueous humour become opaque from inflammation, and in true chronic *corneitis* the cornea becomes nearly white; but in general inflammation of the eyeball, the cornea preserves its perfect transparency in the acute or early stage at least, except for a short distance at its margin, which becomes gray. A gray ring, therefore, forming the edge of the cornea and somewhat resembling, but not so broad or opaque as the *arcus senilis*, is therefore held to be another characteristic appearance in *iritis*, or inflammation of the eyeball. This is not, however, always present, or it is obscured by the encroachment of the vessels of the conjunctiva, which are often enlarged in these cases. It should indeed not be forgotten that the conjunctiva covering the sclerotic often partakes of the general inflammation, and thus the network of enlarged veins which constitutes the increased vascularity in that membrane is spread over the converging arteries and pink zone of the inflamed sclerotic, and obscures them; so that the practitioner derives no satisfactory information from that source, and may even be led to suppose that he has to deal with conjunctival inflammation, and not with inflammation of the eyeball.

The state of the membrane lining the chamber of the aqueous humour should be the next object of the practitioner's attention. This structure is so delicate and transparent that in a state of health its existence cannot be demonstrated, except on the back of the iris; and it is only from the changes it undergoes in inflammation that satisfactory proof of its presence can be obtained. That when inflamed it becomes opaque, forms adhesions with the iris, and secretes pus and lymph, cannot be denied; but in simple inflammation of the eye neither all nor any of these consequences are constantly observed; on the contrary, it often happens that none of them are present. The state of the anterior chamber should, however, be carefully scrutinized, and if it appears clouded, or that its perfect transparency be in the slightest degree impaired, the existence of inflammation may be inferred. That this loss of transparency is not to be referred to any turbid state of the aqueous humour, but to a loss of transparency in the membrane, admits, I think, of ample proof, and I shall again return to the subject when considering syphilitic inflammation of the eye, because it is in that peculiar form of disease that change in structure of the membrane of the aqueous humour is most conspicuous. Purulent matter is seldom secreted into the chamber of the aqueous humour in simple acute inflammation of the eye, although it often is in inflammation of the same texture caused by injury or irritable ulcer of the cornea. When it does appear it is not a very formidable symptom, as it is soon absorbed, and I have seen it where the inflammation was not very intense. It may, perhaps, be looked upon in some cases as indicative of a more languid or unhealthy state of constitution. It is scarcely necessary to say that this is the effect of disease, which is called by authors *hypopyium*; and I shall have to return to its consideration at a future period.

From what has been already said respecting the state of the iris, and the extent to which it is implicated, it is scarcely necessary to observe that this part of the organ should be most accurately examined in inflammation of the eye, of whatever character it may be. The alterations in colour which take place in it, the effusions or secretions of lymph or pus which are poured out, and the irregularity and adhesions of the pupil, afford most instructive evidence of the nature and extent of the disease. In the first stage the colour of the iris is altered at the very commencement of the attack, while at a more advanced stage the colour is still more altered, and often even continues permanently altered. These changes of colour are, however, to be attributed to very different causes. The change of colour at the commencement is obviously produced by a simple increase of arterial or venous vascularity, or both; that at a more advanced stage by effusion of lymph or purulent matter. The iris is one of the most remarkably vascular parts in the whole body, so much so that many have considered it to be of the nature of erectile structure. When injected, it appears as if entirely composed of arteries, and these arteries are so large that I have often injected them in considerable numbers while injecting subjects for dissection from the heart with paint injection. When injected from the carotid with size and vermillion in a young subject, and then spread on talc and preserved in spirit of turpentine, it exhibits a beautiful specimen of vascular distribution; vessels running from the circumference to the centre in great profusion. An engraving from a drawing of such a preparation is annexed to a paper on the anatomy of the eye, communicated by me to the Royal Medico-Chirurgical Society of London, and published in the 12th volume of their Transactions. The consequence of this extreme vascularity is, that when the arteries become enlarged by inflammation, a greater quantity of

red blood is added to the natural or ordinary circulation, and thus the colour is altered; the bright tint of a light blue iris being changed to a dull or indigo shade, and a gray or faint blue acquiring a leaden hue. The hazel iris is also altered, the dull yellowish appearance becoming a light brown; and even the rich brown of what is called a black eye is somewhat deepened in colour. I would not, however, have the observer rely too much on the alterations in appearance of the iris in the first stage from mere increase in vascularity, except perhaps in eyes of light colour; because, in the first place, if both eyes are attacked, he cannot tell what may have been the healthy or natural tint; and secondly, because, if one only is affected, he cannot positively say that it is discoloured, if it differs somewhat from the other; for sometimes the colour is not exactly the same in both eyes. Still the state of the iris in the first stage of acute inflammation of the eye should in all cases be carefully examined. But there is one thing not to be overlooked by the practitioner, and that is, the remarkable and often curious appearance presented by the iris in its natural or ordinary and healthy state. In the paper to which I have alluded, published in the Medico-Chirurgical Transactions, and which I have lately republished in a volume of collected essays, I have endeavoured to describe the muscular arrangements on the face of the iris, and have given an engraving from a very faithful drawing of one in which what I think resembles the *carneæ columnæ* and *chordæ tendinæ* of the heart were very conspicuous; yet it often happens that this arrangement, so defined, distinct, and marked in some eyes, is scarcely to be distinguished in others. The iris in some persons is found also to be marked in several places with large dark dots or patches, and occasionally a large portion seems as if stained with a light brown like iron-mould. When eyes presenting these peculiarities are attacked by

inflammation the practitioner is liable to fall into the error of attributing some of them to the effects of disease, which they sometimes resemble; but recollecting what is here stated, he will see the necessity of caution in this respect. I advise students to make it part of their study to examine the iris in a healthy state, in order that they may become familiar with its natural appearance in all its varieties, and that they may not have to examine it in an inflamed eye for the first time, and thus be liable to confound its ordinary with its diseased condition.

After considering the state of the iris as to colour in the first stage of acute inflammation, the changes which take place in the pupil should next be examined. This aperture in a sound eye is bounded by a circular edge or margin, and is very nearly in the centre of the iris, but inclines rather to its inside than the outside; any deviation from this circular form and central position must therefore be looked upon as the consequence of disease. In other words, an irregular or eccentric pupil is a consequence and a symptom of inflammation. The irregularity should be sought after in the earliest stage, because it is one of the first organic changes, and is generally, if not always, a forerunner of adhesion to the capsule of the lens, the next destructive consequence to be apprehended. The pupil appears as if slightly pinched, or drawn aside at one or more points, or it is contracted for one-third or one-half of its circumference, while it is free in the opposite direction; thus becoming eccentric and more or less irregular in its circumference. Adhesion to the capsule of the lens is the consequence, if not the cause, of these irregularities, but at this period it cannot be distinctly seen because the pupil does not dilate. It should, however, be assumed that, visible or invisible, this untoward effect is taking place, and every effort should be made to arrest its progress, as it often ultimately proves very injurious to vision.

The practitioner should never forget that the margin of the pupil, in a young and sound eye at least, is actually in contact with the capsule of the crystalline lens, and that if the membrane of the aqueous humour be inflamed, adhesion must therefore inevitably take place unless the parts can be kept separate. This is not generally believed, although I have endeavoured to convince anatomists and others that it is so in the paper to which I have alluded; but I advise persons treating inflammation of the eye to act upon a conviction of its truth, because thereby they will be brought to proceed with more decision as regards this point. I would also advise practitioners to place little reliance on the assumed fact that these adhesions take place from an effusion of lymph, or that any such effusion can be seen in such cases; because it is by no means proved that what is called coagulable lymph is essentially necessary to form these adhesions, and if it is necessary, or does exist, it is in such small quantity that it cannot be seen. Serous membranes when inflamed, if in contact for any considerable length of time, adhere together without any visible layer of lymph being deposited between them. In alluding to other forms or modifications of inflammation of the eye, I shall have to state that the pupil, in place of being contracted, is on the contrary, greatly dilated, and when sight is lost from destruction of the retina, *gutta serena*, instead of contracted, and adhering pupil is the result. How far this is owing to some unexplained modification of the inflammatory action, or how far to be attributed to the relation of the parts to each other, appears doubtful. I have in my lectures endeavoured to account for it by explaining that when the lens is very flat, as it is in aged and probably in very long-sighted persons, the margin of the pupil cannot adhere to it, because it does not come in contact with it, and this explanation I support on the ground that this dilatation of the pupil occurs more

frequently in aged than young persons. It also, perhaps, occurs more frequently when the lens has been removed by operation. It should, however, be recollected that from whatever cause it may be, complete dilatation of the pupil sometimes exists in eyes destroyed by simple uncomplicated inflammation, and occasionally to such a degree that the iris becomes almost invisible, so much is it shrunk or retracted towards the ciliary ligament and circumference of the cornea. Perhaps it may be urged that this dilatation of the pupil arises from loss of sensibility of the retina, or *amaurosis*, or in other words, from complete blindness: it being well established that such dilatation or *gutta serena* sometimes attends this state of the nerve, whether caused by disease within the head or by inflammation. We, however, so generally, if not uniformly, find vision so impaired or so completely suspended in these attacks, without dilatation of the pupil, that I think the enlargement cannot fairly be attributed to the mere loss of sight. At all events, from whatever cause it may arise it is a bad symptom, and much more to be feared than irregularity, contraction, or adhesion.

The state of the pupil as regards irregularity, adhesion, and dilatation, having been considered, its contractile power should next be ascertained. It is scarcely necessary to say that in health it contracts when the eye is exposed to a strong light, and that it dilates when withdrawn from it; it also contracts when an effort is made to view near objects, and returns to its former state when that effort ceases. The iris, however, in acute inflammation, loses this power of motion, and the pupil becomes fixed, and generally somewhat contracted, although, as has just been seen, it is sometimes dilated. This, however, does not always take place to the full extent; the pupil in mild cases of inflammation of the eyeball, where the iris is not much altered, sometimes contracting and dilating, although

slowly. To what this loss of contractile power is owing cannot be positively stated. No muscle in a state of acute inflammation is perhaps capable of effectual contraction: it is not paralyzed, but it does not contract, but seems to remain in a state between relaxation and contraction; and such appears to be the condition of the iris under such circumstances. It will not even dilate under the application of extract of belladonna made freely to the brow and lids during the acute stage in severe inflammation, although it soon yields as the inflammation gives way. In eyes destroyed by inflammation, neglected or mismanaged, and with contracted and adhering pupil, the contractile power is totally lost, and the firm and resisting iris is converted into a flaccid membrane.

The alterations in the state of the pupil having been described, attention should next be paid to the changes in the structure of the iris from the progressive inflammation. Of these the most remarkable is the effusion or secretion of yellow deposit, apparently coagulable lymph or purulent matter. This consequence of inflammation seldom occurs except in syphilitic inflammation, and now that the disease is better understood and more easily recognized, it is seldom seen even in it, in consequence of the early use of mercury. It appears in the shape of one or more circumscribed, flat, yellow, circular patches on the surface of the iris, or in the form of a spherical projecting tubercle of the same colour, about the size of a small grain of shot. These patches or tubercles appear sometimes to run into each other, and thus form continuous irregular masses. They are considered to be deposits of coagulable lymph or abscesses, but little is known respecting the real nature of the effused matter, except from analogy, and the knowledge derived from their origin and termination. That they may be abscesses or collections of fluid pus, may perhaps be admitted; but if they are, it is remarkable that

they are seldom seen to break or open and allow their contents to escape into the aqueous humour. If they are composed of coagulable lymph, it is not a mere naked drop or spherical mass of that product of inflammatory action which is secreted or effused on the surface, as it is in certain inflammations of serous or mucous membranes, but a deposit behind or under the surface of the delicate membrane which covers the iris as well as all other parts in the chamber of the aqueous humour. This I believe, because the surface of them when carefully examined with a lens of short focus, is found to be covered over with ramifications of bloodvessels, and because they are generally sunk into or project from the structure or thickness of the iris. Sometimes the secretion or effusion is not defined or circumscribed, but is diffused through the greater part or the entire of the iris, appearing in the shape of a dull-red or light-brown irregular ring surrounding the pupil, or one general stain of yellow matter, which sometimes remains permanently, giving to this part of the eye a bright greenish-yellow colour. Even blood is in some cases effused, but these being more consequences of inflammation, caused or modified by serofula, syphilis, gout, or rheumatism, I will reserve whatever remains to be stated respecting them until I come to consider these modifications.

The changes which take place in the sclerotic, cornea, membrane of the aqueous humour, and iris, having been noticed, those which occur in the crystalline lens, vitreous humour, choroid, and retina, remain to be described. These, however, will be best considered in detail when treating of cataract and amaurosis or insensible retina. Here it is only necessary to say that there can be no doubt that these structures participate more or less in the general inflammation of the eyeball. Cataract or opacity of the lens, it is true, does not appear in the early or

acute stage, but in eyes destroyed by this disease, and where the pupil is adherent and the retina insensible, the lens is not only opaque, but completely disorganized. The greatly impaired or lost vision proves that the retina is deeply implicated from the very commencement, and the permanent blindness which frequently follows, proves that this is owing to destructive inflammation, and not to any temporary increased vascularity either of it or the choroid. From beginning to end the practitioner should watch the state of vision with the greatest care, and should often rely more on his observations as to this than on the appearance presented by the visible parts. That the vitreous humour partakes of the general mischief may be inferred from the fact, that in eyes destroyed by inflammation, the hyaloid membrane has almost disappeared, and the eye has lost all its firmness, becoming soft and flaccid to the touch, and when opened in operations or after death, becoming empty from the escape of the unsupported fluid.

In every form of inflammation of the eyeball, whether simple and uncomplicated, syphilitic, rheumatic, arthritic, serofulous, or neuralgie, defect or loss of vision constitutes one of the most alarming symptoms, and should be watched by the practitioner with the greatest anxiety. If called on at once, as he probably will be by persons who have already suffered from previous attacks, he should ascertain with care to what extent sight is impaired. The attention of the patient should be directed to near and distant objects, both in strong and weak light, for the purpose of subsequently comparing this state of vision with that which follows. At the very commencement the defect is but slight, amounting to little more than a cloudiness, causing indistinctness of vision. This is particularly observed on looking at a lighted candle, the flame of which appears as if viewed through a fog or haze, and the patient should be

closely questioned as to this point, because it is one which affords valuable information when other symptoms are doubtful. It is necessary, however, to be very cautious as to the statements made by patients respecting this and other defects of vision, because persons not in the habit of thinking before they speak are very liable to say that which may be suggested to them by a question. They should therefore be asked whether the candle presents any unusual appearance, and not whether it appears as if seen through a fog; and if they cannot give a satisfactory answer, they may be then asked whether they see the flame, the wick, and the candle itself, clearly and distinctly, and with a well-defined outline. So also with respect to distant objects, they should be called on to describe them, and to state what they see and what they cannot see; and as to near objects, the size of print found legible by them will afford a good test; recollecting always, however, that the person may be naturally near-sighted, or that he may have always had some defect of vision. In the more advanced stages of inflammation the loss of sight is so great that no doubt can now exist on the subject. The patient can no longer see the most remarkable objects, and at length if the inflammation is not checked, he can only distinguish light from darkness. To what this rapid diminution of sight is owing seems doubtful, for it often, if not generally, in syphilitic inflammation at least, returns as rapidly, and in a short time is as perfect as before. It can scarcely be from the inflammation attacking the retina to such a degree as to suspend its sensibility to light altogether, because in that case we could not expect to find it recover so completely and so quickly as it often does. A texture of such exquisite delicacy of organization could scarcely escape injury if subjected to such destructive influence. I am more inclined to attribute the sudden but temporary loss of vision to the increased vascularity of the choroid upon

which the retina is expanded, and I believe that this might be taken as a proof of the extension of the inflammation to the former structure ; which, although we cannot see it, has probably its numerous arteries and vorticose veins greatly gorged with blood. It should not be forgotten that inflammation of the eyeball sometimes commences with defective vision only, and that very serious loss of sight takes place before any redness of the sclerotic or discolouration of the iris is perceived. When this occurs the inflammation is said to commence with amaurotic symptoms, and such are sometimes described as cases of amaurosis, but they are evidently cases of inflammation of the eye commencing in the retina or choroid, and extending ultimately, if unchecked, to all the other parts, as I shall endeavour to explain when considering amaurosis and retinitis. In this stage of the inquiry it is not, however, premature to warn the practitioner, especially in dispensary practice in Ireland, to exercise the greatest vigilance when applied to by persons complaining of defective vision suddenly or recently perceived ; much valuable time being often lost from a generally received opinion that such defect may be caused by some derangement of the stomach or other organs. In acute inflammation of the eye commencing suddenly and proceeding rapidly to inflammatory vascularity of the sclerotic and alteration of colour of the iris, the appearances called *muscæ volitantes* and ocular spectra are not perceived, or if perceived, are so soon followed by greater defects of vision that they are not noticed. It is in inflammation of the retina, whether extending to the other parts or not, or in less active and less obvious general inflammation of the whole eye, that they attract attention, and constitute an important symptom, and it is in alluding to such cases I shall have to describe them. The practitioner should not, however, neglect inquiring as to their having existed previous to the appearance of the inflam-

mation, because their occurrence at that period proves that the disease had commenced some time before in the retina, and had extended from that to the rest of the organ.

The kind of pain which exists in inflammation of the eye, and its extent and duration, requires more consideration than it has generally received in books. It seems not to take place in proportion to the degree of inflammation or its destructive effects, for we often find it inconsiderable in severe cases, and where organic changes of the most injurious nature occur, while sometimes it is most distressing in less acute forms of disease, and in which alterations injurious to the integrity of the organ do not at first attract so much attention. To whatever cause it may be attributed, it must be admitted that it is not necessarily a prominent symptom of inflammation of the eye, and that in many cases it can scarcely be said to exist at all. In syphilitic inflammation it is, I believe, generally inconsiderable, while in truly rheumatic and arthritic attacks, it is severe and harassing; and, as I shall have hereafter to show, in some cases it assumes a neuralgic character, and has regular remissions or intermissions. That severe and destructive inflammation of the iris should take place without severe pain is surprising, when we recollect that there is not perhaps in the whole body a part which receives so great a quantity of nerves in proportion to its size; yet in the syphilitic form, the very species which seems to affect it more than any other portion of the organ, the pain, if any, is not remarkable. It is also to be recollected that the iris is acutely sensitive to injury, a touch of the needle in operating for cataract, or the pressure of a fragment of the broken lens, causing severe pain. However to be explained, it is a valuable fact in pathology, teaching the practitioner, as it does, that he should not rely on the presence or absence of pain as a certain indication of the nature or amount of

inflammation ; the most acute degree of it sometimes existing without corresponding destructive alteration, and its absence being often a character of the worst forms of disease. When pain from inflammation of the eye or its appendages does occur, it is of different kinds. In inflammation of the conjunctiva there is the hot and scalding pain of cutaneous inflammation ; in sudden and acute inflammation of the eyeball from exposure to cold or wet, it is the same pain which accompanies inflammatory tumefaction restrained by resisting parts ; and in chronic inflammation of neuralgic character, it is a dull aching pain or agonizing torture. In inflammation of the eyeball it is the throbbing, intense, dull pain of inflammatory tumefaction, like that which exists when parts beneath fasciæ are affected that is most to be dreaded, and which requires most prompt treatment ; the neuralgic pain admits of more delay and often requires time for its removal. Pain sometimes is caused by coughing, sneezing, or any other effort which influences the circulation through the respiratory organs, and it is generally caused by pressure on the eyeball, however gentle. When other symptoms are obscure, inquiry and examination as to this point should be made.

The amount of intolerance of light which commonly exists in inflammation of the eyeball does not appear to be well ascertained. If we judge from the precautions usually adopted to exclude light altogether in such cases we should be led to conclude that it always exists to a considerable degree, yet such is not the case. Intolerance of light, or painful dazzling from exposure of the eye, is not a constant or essential symptom, and in syphilitic inflammation especially it is, I think, not a usual one. Indeed I should almost venture to say that the assumption so generally adopted, that light causes pain when it falls on an inflamed retina is a mistake, and that the practice

so commonly pursued of immuring persons suffering from inflammation of the eye in a dark room is founded on a vulgar error. I do not deny that intolerance of light often takes place, but I do not believe that it is a necessary consequence of inflammation, and I am inclined to think that it is often induced by the very means employed to prevent its occurrence. I am, in fact, convinced that, as in a state of health, the retina is rendered more acutely sensitive to light by confinement in darkness, so in inflammation, the same cause produces the same effect; and that the confinement of the patient to bed in a room, with the curtains drawn and the windows closed, brings on the very malady which is so much feared. On this conviction I am in the habit of acting. In hospital I have no green walls or shaded windows, and in private practice I never permit the light to be excluded, unless intolerance of it actually exists. If the patient has followed the usual unhealthy practice of sleeping in a bed hung round with curtains to exclude light and confine foul air; and in a room with closed windows, in addition, I cannot perhaps venture to alter this bad habit at once, but I do all I can to mitigate the evil by insisting on some illumination of the room, and some ventilation round the patient; so inveterate, however, is the prejudice in favour of these objectionable domestic arrangements, that I find great difficulty in obtaining consent to a change. I shall have to revert to this topic hereafter when speaking of what is called serofulous ophthalmia.

PERMANENT EFFECTS OF INFLAMMATION OF THE EYEBALL.

I HAVE in the preceding observations described the appearances, symptoms, and changes in structure produced by inflammation of the eye, the final effects of it should, however, be also considered and carefully noted. Writers

and lecturers on diseases of the eye usually allude to certain "stages" of inflammation, but without defining distinctly what constitutes the difference between these stages, or how many of them are to be enumerated. It appears to me that if we make use of the term, or endeavour to restrict certain symptoms to certain periods of the disease, we should consider the first stage to be confined to that period in which no change, except increased vascularity and its immediate consequences, tumefaction, pain, loss of transparency, discolouration of the iris, inactivity of the pupil, and defective vision, take place. The second stage, if to be defined, should, I think, be restricted to that period during which adhesion of the iris to the capsule of the lens, effusion or secretion of lymph or purulent matter, and disorganization of the lens or retina, causing cataract and amaurosis, ensue. If a third stage be spoken of, it should be limited, I think, to that period in which the effects or consequences of the two preceding stages are conspicuous, such as increased size of bloodvessels, permanent adhesion or closure of the pupil, cataract, amaurosis, alteration in shape of the eyeball, yielding of the sclerotic, and softening of the vitreous humour. Where the terms acute and chronic are used, it appears that the two first stages above alluded to are considered to constitute the acute, and the last or third here noticed the chronic. In other words, the progressive inflammatory action constitutes the acute, and the effects or consequences the chronic stage. In all inflammations of the eye or its appendages, as well as in other inflammations, it would be well to define strictly and rigidly these terms, acute and chronic, and to distinguish distinctly the difference between true inflammation and the consequences of inflammation; because we often find the increased vascularity, exalted sensibility, and impaired functions which remain after inflammation subsides, called

the chronic stage or chronic inflammation, whereas these are really the effects only of the preceding inflammatory attack. I do not mean to deny that some forms of inflammation are more rapid in their progress and more active in their operation, or that other forms are slower and less remarkable in symptoms: I only wish to argue that the consequences or effects of acute inflammation should not be called chronic inflammation. Be this, however, as it may, we find that after the inflammation subsides, many appearances more or less permanent are observed. The characteristic vascularity of the sclerotic in moderate attacks of inflammation terminating favourably soon disappears, and its diminution, allowing the whiteness of that membrane to reappear, is one of the first satisfactory symptoms of amendment; but the practitioner must not assume, if the redness continues, that therefore inflammation continues. The redness caused by the increased vascularity of inflammatory action continues long after that inflammatory action has ceased in the eye, as it does in other parts of the body. It continues in the same way after inflammation of the conjunctiva, as it continues in the skin after a blister or the healing of any common sore. In fact, vessels enlarged by inflammatory action require time to return to their original dimensions, and sometimes many months elapse before they resume their natural condition. The difficulty of distinguishing vascularity, the consequence or effect of inflammation, from the vascularity of inflammation itself, is however, often considerable, because as long as the eye remains red, or as it is called, blood-shot, every cause usually inducing inflammatory action revives the original condition of the part, and reproduces irritation, pain, and tumefaction, and often to such a degree that it amounts to a relapse to the acute form. I have dwelt on this point longer than may perhaps appear necessary, but I

have so often seen and heard persons confounding the effects or consequences of inflammation with inflammation itself, that I consider it of great importance to have the distinction between them accurately laid down.

In observing the final effects of inflammation of the eye; in examining an eye, in fact, which has been injured or destroyed by inflammation, the state of the vessels of the sclerotic should not be overlooked. The membrane is found either generally red or blood-shot throughout, or, especially in cases where there has been much mismanagement and neglect with frequent relapses, it is found defaced by large veins irregularly ramifying in its substance. This condition is indicative of extensive destruction of the other parts of the organ. Should the sclerotic, in cases where the eye has been much injured by inflammation, not present any very unusual vascularity, it should be gently pressed by the fingers applied over the closed eyelids, which will cause great redness if it still continues in this extraordinary state of vascularity. This is an examination not to be neglected when operations for cataract or artificial pupil are contemplated in such cases, because this state of parts affords little encouragement to resort to them. The sclerotic coat of the eye not only presents the changes in vascularity above alluded to, but it undergoes another change from protracted inflammatory action, or from repeated attacks or relapses of inflammation. Its structure or texture becomes thin, as if dissolved or absorbed, and it bulges or yields so as to allow the black choroid beneath it to appear, and even to project in the form of a dark blue tumour or staphyloma. This generally takes place near the margin of the cornea, and sometimes several small prominences of this kind surround that part; or it is almost encircled by an elevated welt of the same colour and description. This thinning or yielding of the sclerotic, with or without staphyloma or projection of the

choroid, has been attributed to inflammation of the choroid more particularly, and has been described as a consequence of inflammation of that membrane, hence called *choroiditis*; but without here entering into any discussion as to the occurrence of a distinct specific form of inflammation entitled to that appellation, I must venture to assert that this disorganization of the sclerotic is a common consequence of simple inflammation of the eyeball, such as I have been describing, and especially is so where the disease has taken place in persons of feeble frame, or serofulous constitution. I shall have to allude to this remarkable change in structure when considering inflammation of the eye modified by constitutional diseases, but for the present I think it necessary to warn the practitioner against assuming that it is a consequence of any such thing as an inflammation confined to the choroid exclusively. Sometimes the sclerotic yields extensively, and the eyeball becomes enlarged uniformly and generally, at other times it enlarges more irregularly, and bulges at one side, or changes its form so as to leave the cornea projecting from it, as it does in the eye of a bird. In other cases this membrane is found shrivelled or contracted, and of a yellow colour. The changes, in fact, which the sclerotic undergoes from protracted or repeated inflammatory action are so numerous and varied that it is impossible to notice them all without entering into tedious and unnecessary details.

The cornea often remains uninjured after a severe attack of inflammation of the eyeball, but it sometimes, in protracted and relapsing cases, undergoes remarkable changes in organization. I have already stated that the effect of acute inflammation on transparent structures is opacity, and I have shown that in the acute stage of inflammation of the eye the edge or circumference of the cornea becomes gray. This, however, does not extend over the entire of

its structure, except in those cases in which it is more particularly the seat of disease, hence called *corneitis*; but when the disease has been very destructive we find the cornea permanently opaque and converted into a white, tough, membrane, very different from the natural organization of the part. Of these opacities there are many degrees and modifications, and sometimes it is not easy to determine whether they may not have been caused by ulceration in conjunctival inflammation. In some cases, and more particularly in syphilitic inflammation of the eye, the back of the cornea presents a remarkable form of opacity. It appears speckled with faint dots, as if spattered with thin white paint from a brush; but this is evidently in the membrane of the aqueous humour, as I shall show presently. Another remarkable change which takes place in the cornea from inflammation is alteration in form and a yielding in structure, such as I have described in the sclerotic. It loses its correct lenticular curvature, and becomes conical or irregularly prominent, or it changes in shape in common with the whole sphere of the eyeball, and becomes flat. Some, I think, believe that the curvature of the cornea is altered, and that the part becomes more prominent in the acute stage, but this is a mistake, arising from persons viewing for the first time an eye in which the cornea naturally projects more than usual. To suppose that this thick, dense, and strong structure could be mechanically stretched or distended by the pressure of any accumulation of fluid within is impossible. When the cornea yields in this way it is a process of growth, a perverted nutrition induced by the inflammatory action.

Of changes more or less permanent in the membrane lining the chamber of the aqueous humour not much is to be observed. That portion of it which lines the elastic or internal layer of the cornea, I have just stated, becomes opaque, and presents the peculiar speckled appearance

which I have described, and that which covers the capsule of the lens becomes irregularly clouded when the pupil adheres to it. The speckled opacity on the back of the cornea, which, as I have said, occurs most frequently in syphilitic inflammation, does not, I believe, in general remain permanently; although it may be observed for some months after all inflammation has disappeared; sometimes, however, I think it may be seen a year or more after, causing much defect of sight. It requires care to distinguish it. Looking directly at the eye from some distance it appears as a general cloudiness of the cornea, or even of the conjunctival layer of it; but looking closely at it with a lens of short focus, the faint, speckled, or dotted appearance is perceived; still it is not easy to demonstrate that it is on the back of the cornea. To be certain of its being situated there the eye must be viewed sideways or in profile, with the light shaded off so as to prevent the reflection from the surface. The opacity of the membrane of the aqueous humour covering the capsule of the lens is much more easily seen. I have not, I think, observed it except in cases where the pupil has become adherent. It is in general an irregularly reticulated faint opacity, as if the front of the lens was obscured by some shred-like torn cobweb, but sometimes it is a mere muddy cloud resembling soiled glass. On careful examination with a lens of short focus, distinct faint lines or pencillings may be perceived running in every direction from the margin of the adhering pupil to the centre. This description of opacity, although generally remaining for some months, ultimately diminishes in density, and often disappears altogether. It causes much distress after recovery from one of those attacks which periodically afflict some persons, on account of the defective vision which attends it; but the patient may be encouraged with the prospect of its final dispersion. Sometimes, however, the opacity is much

denser and deeper, evidently extending beyond the membrane of the aqueous humour and into the cartilaginous structure of the capsule itself. When this takes place, a small, white, defined patch is seen at the point where the margin of the pupil adheres, corresponding exactly to the point of adhesion and confined to that spot, and not spreading to the centre, which remains perfectly transparent. There are generally two or three of these opaque specks corresponding to the same number of points of adhesion. In other cases the whole margin of the pupil adheres to the capsule, and at the place of adhesion a dense, distinct white circle corresponds to the edge of attachment, leaving the centre free and transparent. These opacities have been called spurious cataracts, and fibrinous cataracts, and are attributed to depositions of lymph; but I do not think that the existence of the lymph has been proved, or that coagulable lymph is necessarily the cause of such. I think indeed that writers and teachers have assumed without sufficient proof that adhesion and opacity must of necessity arise from effusion of lymph, notwithstanding the impossibility of demonstrating the presence of any such material; and I think that the sooner such assumption, if unfounded, is given up the better, because it leads to incorrect notions as to prognosis and treatment. In some cases a curious appearance is perceived after inflammation subsides. A shred of the membrane of the aqueous humour which covers the back of the iris, and which is deeply stained with black pigment, is found detached and adherent to the face of the capsule of the lens. When present it is easily seen, being a well-defined, irregularly-shaped, black patch sticking to the surface. The only way in which its existence can be well explained is by supposing that the margin of the iris had adhered there, and that when the pupil became dilated after the inflammation had subsided, a particle of the black membrane which is very loosely

attached here, was torn off, and remained. It is a defect which continues permanently.

The state of the iris after all inflammation has disappeared is as remarkable as it is during the progress of inflammatory action. The change of colour, the contraction and adhesion of the pupil, and the loss of moving power, during the acute stage, have been described, and it now remains to enumerate the permanent alterations in structure and function. The colour of the iris, if altered by mere increased size of its bloodvessels, is perfectly restored when inflammation has entirely subsided, but if altered by effusion of lymph or pus it often remains permanently changed in appearance, and sometimes assumes a bright yellow-green hue. Where no lymph or pus has been effused the natural colour appears merely faded. Distinct red vessels are not seen separate from each other in the acute stage, but in some cases after repeated and protracted attacks they may be perceived with a lens of short focus, and sometimes even with the naked eye. Whenever found the practitioner may be certain that the organ has suffered from severe and destructive inflammation, frequently recurring and long continued. The power of motion is destroyed by violent inflammation when unchecked, and the pupil ceases to act even although it should not adhere to the capsule of the lens. When closed and adherent to the capsule it is generally found not only motionless but entirely unaffected by extract of belladonna or its active principle atropia in any form; and in any attempt to form an artificial pupil it stretches under the instrument like a lifeless membrane, and affords so little resistance that an opening can be made in it by an extensive sweep of the knife only, or by a large cut of the scissors. Such an opening also will not gape even when of considerable size, but will close again from the edges falling together. The iris,

disorganized by inflammation, is sometimes even so flaccid that it projects or falls forward towards the cornea, and sometimes even touches that part. When disorganized, but not adherent, it sometimes hangs in the aqueous humour, like a preparation in spirits, shaking as the eye moves, and presenting a very remarkable tremulous condition. This tremulous state is not always the consequence of inflammation, for we sometimes find it in certain forms of cataract and amaurosis, and sometimes even in eyes not otherwise very defective. It is also found to exist after the removal of cataract, and even when the operation has been successful. Accompanied, however, by very defective vision and other consequences of destructive inflammation it is evidence of extensive mischief. In describing the symptoms and effects of the acute stage of inflammation, I mentioned that the pupil was sometimes dilated instead of being contracted. This dilatation continues permanently, and if unaccompanied by cataract or opacity of the lens, but with amaurosis or insensibility of the retina, it constitutes the appearance called *gutta serena*. Sometimes in such cases the dilatation is so complete that the iris almost disappears. The adhesions of the iris to the capsule of the lens have been alluded to in describing the changes which take place in the membrane of the aqueous humour, but they must be more particularly described, because they cause imperfection of vision, which may be remedied by their diminution. Whenever the pupil is found even slightly irregular after an attack of inflammation has entirely ceased and all redness has cleared away, adhesions may be suspected, and if on closing the opposite eye, and shading off the light with the hand, the irregularity becomes more manifest, they may be considered with certainty to exist. Examined with a lens of short focus they appear as brown strings running from the edge of the

iris to the lens, broader at the attachment to the margin of the pupil, and narrowing to a point at the place of attachment to the capsule. They are evidently portions of the membrane of the aqueous humour covering the back of the iris drawn out into a string by the dilating action of the part. If the pupil be dilated with belladonna these adhesions are rendered much more conspicuous, and the pupil is converted from an irregular circular aperture to one shaped like a trefoil if the adhesions are three in number, or to one of four or five compartments if the adhesions are more numerous. Sometimes, as I have already said, the adhesion is continuous all round and accompanied by a corresponding circle of opacity of the capsule. In the worst cases the pupil adheres completely with a rough undefined edge to a completely opaque white lens.

The state of the crystalline lens should be carefully noticed when examining an eye injured or destroyed by inflammation. That the lens partakes of the inflammatory action in common with all the other parts of the eye during the progress of the disease cannot be denied, and that opacity, the usual effect of inflammation of transparent parts, is often the consequence, is equally certain. In other words, cataract, both lenticular and capsular, is often produced by the inflammation. I have already described the opacities which form on the surface of the capsule of the lens when the margin of the pupil adheres to it, being the "spurious" cataracts of writers on this subject: when the disease, however, proceeds unchecked still farther, the entire thickness of the capsule becomes altered, and the area of the irregular and contracted pupil is occupied by a white, dense, firm material, hard and tough as cartilage, which in fact it is. I have elsewhere said that the capsule of the lens is formed of transparent cartilage, and it is not therefore wonderful that it should

be converted into an opaque cartilage of greater thickness and density by inflammation. The nature and appearances of capsular cataracts will be described hereafter ; I have now only to enumerate this as one of the consequences of destructive inflammation. The effects of the inflammation are not, however, confined to the capsule ; the lens itself may, and often does, become opaque, and not only opaque but completely disorganized, diminished in size, and converted into a white friable material of the consistence of cheese. In fact, when the practitioner finds an eye some months or years after an attack of destructive inflammation, having its pupil contracted and adhering to a cream-coloured perfectly opaque cataract, he may be certain that both the lens and its capsule are altered in the way here described. Cataract from inflammation is not, however, confined to the capsule, neither is the capsule itself always opaque, for we often find common lenticular cataracts caused by it, as I shall show hereafter. Sometimes the lens instead of becoming opaque assumes a peculiar greenish hue with some degree of cloudiness, varying in appearance according to the direction of the light, or as we view it directly or obliquely. When viewed directly and in front, it appears more or less opaque or approaching to the state of cataract, but when examined sideways the transparency does not seem so much impaired. This greenish and slightly clouded state of the eye cannot, however, be altogether referred to the lens, but seems to extend beyond it and to belong to the vitreous humour, or even to the retina ; the whole space from the pupil to the choroid in the bottom of the eye appearing as if filled with a greenish mass of semi-transparent matter. This is what is called *glaucoma*, and what, with its accompanying alterations in other structures and its symptoms, is described as a distinct disease, but which is really nothing but a consequence of general inflammation of the eyeball

of slow progress in advanced life, and perhaps modified by gout or rheumatism. That this is so the very descriptions and treatment of the disease prove. I do not, however, mean to say that this peculiar, greenish, somewhat opaline appearance behind the pupil, is necessarily a consequence of inflammation; because, on the contrary, it often exists in the earlier stages of cataract in advanced life. That the appearance described is owing to change of colour and slight opacity of the lens can I think scarcely be doubted, because when the lens has been extracted in such cases it presents the usual amber tint and clouded condition of cataract from age. Dr. Mackenzie of Glasgow, who dissected several eyes which presented this appearance, found the lens of a "yellow, amber, yellowish-red, or reddish-brown colour, of firm consistence, and its transparency perfect or nearly so. In some cases, however, the reddish-brown colour of the central part of the posterior lamellæ was so deep as to impair its transparency."

The changes which take place in the vitreous humour from inflammation do not appear to be remarkable or considerable: opacity which so frequently occurs in the crystalline lens seldom if ever is found in it. Sometimes a general cloudiness behind the pupil appears to exist in this structure, but it is owing to loss of transparency of the lens, or the posterior portion of its capsule, and perhaps occasionally to disorganization and consequent opacity of the retina. The vitreous humour, however, undergoes a peculiar change from inflammation, and perhaps sometimes without it. The hyaloid membrane, or delicate cellular structure which holds the water, disappears, leaving the fluid free. That this is the case has been proved by dissection, by the escape of the water in the operation of extraction, and by the falling down of the lens out of its place in using the needle. It also becomes evident in cases where the eye has been greatly injured by

inflammation, the eyeball in such cases feeling quite soft and flabby or flaccid when pressed by the finger. This state seldom exists without corresponding disorganization of the retina and consequent blindness, and should therefore always receive attention; sometimes, however, it takes place partially without loss of vision.

Of the changes produced in the choroid by inflammation we do not know much, it being invisible. The projection of it through the sclerotic when thinned in long-continued disease has already been noticed. That the black pigment is often more or less removed from its inner surface is an established fact, but whether owing to inflammation or not, is not so certain. It appears to be a change consequent on advance in life.

That the retina is always deeply and extensively implicated in inflammations of the eye, the almost invariable occurrence of impaired vision proves, but from its situation the change of structure which takes place cannot be seen. This most important subject I propose, however, to consider under the head of amaurosis, and therefore do not now dwell upon it.

TREATMENT OF INFLAMMATION OF THE EYE.

BEFORE considering inflammation of the eye as modified by constitutional disease, it is necessary to consider the treatment of simple inflammation of the eyeball not complicated by any unhealthy condition of the system in general. It does not appear that inflammation of the eyeball requires to be treated on principles different from those which guide us in the treatment of inflammation of other parts. The heart's action is to be weakened and the size of the capillary vessels reduced by diminishing the quantity of circulating blood by bleeding; and that weakness of

the heart's action and reduction in size of vessels is to be continued by nauseating medicines until the local vascular disturbance is subdued, or until the attempt is found fruitless. The supply of new blood is at the same time to be cut off by removing the contents of the intestine by purgatives and a denial of nutritious food; while the secreting powers of the liver, kidneys, and skin, are to be put in requisition to rid the fluids of pernicious ingredients, should such be present. These are the resources of medicine in the first or acute stage of the disease, but when the inflammation proceeds unchecked other remedies must be employed. In what I consider the second stage the effects or consequences of inflammatory action are to be prevented or arrested, such as adhesion, effusion, opacity, thickening, and complete disorganization, with loss of healthy functions; and this is to be effected by medicinal agents exercising peculiar or specific influence, the nature or direct operation of which we do not well understand; of which mercury, iodine, bark, colchicum and turpentine, are the principal. In the third stage, when the inflammatory action has entirely subsided, and its more permanent consequences only remain, the efforts of the practitioner are directed, often in vain, to effect the stretching of adhesions, the restoration of transparency, and the revival of sensibility and muscular contractility, by the application of belladonna, and the internal administration of mercury or iodine in smaller doses and for longer periods, with local stimulation and cutaneous irritation.

With respect to the real value of bleeding either general or local, and the period at which it is most to be relied upon, practitioners might, I think, with advantage review their opinions. While it must be admitted that at certain times and under certain circumstances, the practice is efficient and beneficial, it might, I think, be admitted, that at other times and under other circumstances, it is either

useless or mischievous. It seems to be assumed by many that abstraction of blood will with certainty arrest local inflammatory action, and hence the frequent and indiscriminate resort to the lancet; yet every day's experience proves to persons of observation, that this is an assumption only, and that in a large proportion of cases thus treated there is little evidence of its beneficial operation. That inflammatory action at its commencement, when no change beyond increased vascularity has taken place, may be, and often is, arrested by sudden abstraction of blood, cannot be denied; but that the consequent adhesions, effusions, opacities, and thickenings of continued inflammatory action, are also to be arrested by such means, is more than doubtful. Inflammation is not found to occur more frequently in the robust and plethoric than in the weak and pallid, neither are its effects more formidable in the former than the latter; but on the contrary, we find it generally more manageable in persons of vigorous frame and sanguineous temperament. I have also observed that the destructive consequences of inflammation are not proportioned to the acuteness of the attack, or if from accident or operation, to the amount of injury inflicted, but are frequently seen in a remarkable degree where the inflammatory action is very languid and the injury very inconsiderable. I am therefore of opinion that the advocates for large and repeated bleedings have not established for the practice so strong claim to unlimited confidence; neither do I think that its beneficial operation, even in general, has been so fully proved as is generally supposed. Its value has rather been assumed, as if by common consent, than appreciated from careful observation and extended experience; and it appears to be often relied upon more from the force of habit and routine of practice than from any positive evidence of its superiority as a curative agent. After many years' experience I find

myself generally treating inflammations of the eye and conjunctiva, as well as inflammation from injury and operations, without much bleeding; and I do not think that the success of my treatment is less than that of practitioners who resort frequently to the lancet and leeches. It should be recollected that we seldom see these cases at the very commencement of the attack, when the abstraction of blood would be most beneficial; most persons considering what they call a "sore eye" of little importance until alarmed by the redness, pain, and defective vision. They are oftener presented to us after the vessels have become permanently enlarged, and the inflammatory condition has been firmly established; and then it is, that the propriety of bleeding comes to be questionable. Inexperienced persons think that when they see the eye very red, it is necessarily in a state of inflammation, but this is a great mistake, for the redness or increased vascularity may be but a consequence of inflammatory action which has ceased or has been subdued. Bleeding therefore should in my opinion be resorted to, if considered necessary, at the very commencement of the attack, when a hope can be entertained that by weakening the heart's action and reducing the size of the capillaries, the disorganizing processes of inflammation may be prevented: to delay it until that stage arrives in which diminution in quantity or deterioration in quality of the circulating fluid might rather retard than promote the salutary processes of the system, appears very injudicious. Having made these observations, I do not, however, wish to urge these objections farther, knowing that the practitioner will be guided as to this matter by the constitution of his patient, the urgency of the symptoms, and the character of the disease. If applied to by a robust and healthy country gentleman, or citizen of full habit and sound constitution, attacked by severe and sudden inflammation

of the eyeball, he will bleed him, and if he does, it should be done effectually; but if his patient be a badly fed peasant, or a mechanic enfeebled by irregular habits of living, he will, I conclude, rely on other means. I prefer taking blood from the arm with a full stream, as I would for acute inflammation of any other organ, to taking it from the temporal artery; because I find that the bandaging necessary after the latter causes inconvenience, and sometimes so much irritation in the vicinity of the inflamed organ that it aggravates the local symptoms. If bleeding be relied upon, leeches may follow the lancet, and the sooner the better; the object being to weaken the heart's action and reduce the size of the capillaries before the disorganizing processes of adhesion, effusion, or thickening are established. They may be applied the evening of the day upon which the bleeding took place, or the next day at farthest, if the inflammatory symptoms shall not have yielded. They should be applied over the cheek bone, or in the hollow of the temple, and not to the eyelids, as they sometimes bite through the thin skin of the latter parts, and cause ecchymosis; or if the wounds inflicted by them inflame, they add to the distress caused by the inflammation of the eye itself. In the progress of the case, it may be necessary to repeat the bleeding, should acute symptoms return, which sometimes happens. It is scarcely necessary to say that cupping may also be resorted to where leeches cannot be procured, and when the practitioner can have the operation performed effectually; but from the scars of the scarificator frequently causing unsightly marks, it should not be employed without consideration.

With respect to purgatives, considered as exercising any special influence on inflammation of the eye, the practitioner should also perhaps revise his opinions, as I suggest he should with respect to bleeding. In common

coarse routine practice, and especially as pursued by persons who are compelled by circumstances to prescribe or administer large quantities of medicines, it is too much a habit to rely on purging; not merely for the purpose of interrupting the nutrition of the body, but as a curative agent, operating in a way which does not seem to be well understood. Some vague notion appears to be entertained that by keeping up a continued discharge from the bowels local inflammation must necessarily be thereby reduced or arrested; yet such has not been proved to be the effect. It also appears that many persons are inclined to assume that the presence of feces in the alimentary canal is something unnatural or unhealthy, yet nothing of the kind has been established; but on the contrary, it is quite certain that such must be, and always is, the state in the ordinary condition of the body. Some reason should therefore be assigned for the administration of purgatives, if they are to be administered. As we diminish the quantity of blood in the system by bleeding so should we cut off the supply of it from without; and with this view we should remove the contents of the alimentary canal to interrupt digestion, chylication, and absorption; but that once effected, there appears no good reason for persevering in the administration of such medicines, unless indeed it be, that we have to deal with a patient who will not restrain his appetite for food, or even submit to the use of that of less nutritious quality. Should this be the case, we have no alternative except the daily removal of what is introduced, as we would administer an antidote for some pernicious material wilfully swallowed. There are, however, other reasons for the administration of purgatives. There is some state of the stomach and alimentary canal, or of the system at large, or of both, which causes the tongue to become foul and coated with a yellowish or brownish mucus; and this must, if possible,

be corrected without delay, because inflammation is, I believe, uniformly found more destructive under such circumstances. For the correction of this we rely on purgatives, in the beginning at least, and in moderation; either for the purpose of removing undigested food, or acting on the mucous membrane to stimulate it to greater, and subsequently to more healthy secretion. With this view the practitioner will probably select those upon which he most commonly relies. I generally give the compound rhubarb pill of the pharmacopœia, or the compound colocynth pill with some of the blue pill at night; and, if necessary, some saline purgative the next day, or some solution of magnesia, with the addition of a bitter and aromatic tincture. It would be misplaced here to enter into details as to the usual methods to be resorted to for correcting the state of the stomach and alimentary canal which coexists with this foulness of the tongue; it is only necessary to insist that when it is present at the commencement of inflammation, whether simple or complicated, or the consequence of operation or injury, it should if possible be corrected without delay. Purgatives are also administered for the purpose of increasing the secretion of bile if found necessary in consequence of any unusual or unhealthy appearance of the discharges from the bowels or by the kidneys. How far we possess the power of effecting this appears still doubtful, notwithstanding the confidence reposed in medicinal agents supposed to operate in this way. The mercurial or blue pill appears to be relied on, but seeing how little effect it produces in this respect when administered in large quantities to induce its specific effects on the system, much confidence cannot be reposed in it. Calomel has better claims, and it is upon it, combined with the compound colocynth pill, I rely for the attainment of this object.

In acute inflammation of the eye commencing suddenly, and exhibiting symptoms denoting active vascular turgescence, nauseating medicines may be necessary, in addition to bleeding, to check its progress. The practitioner is not, however, very often called upon to resort to the use of this remedy, because he is more frequently consulted after the disease has passed its earliest stage. In a young and vigorous person attacked severely, the tartrate of antimony may be given; at first, perhaps, in combination with a purgative in solution, and afterwards alone, in solution or otherwise, until it has had a fair trial. Men of active habits suffer so much distress from the loss of time and interruption to business, caused by the necessary confinement during the treatment of a formidable attack, that an attempt should be made to cut it short by this means, and bleeding; although doubts may be entertained as to the success of the trial; especially as such a course is an appropriate preparation for the mercurial treatment which is probably to follow. In those cases which are repetitions or returns of former attacks repeatedly treated with mercury, I generally try depletion and antimonials, with confinement to bed and low living, for two or three days, before I resort again to that remedy, and often with success. I give tartrate of antimony or James's powder at first to cause slight nausea occasionally for about twenty-four hours, and for another day or more continue it as a diaphoretic.

Mercury, which above all other remedies, is most to be relied on in the treatment of inflammation of the eye, remains to be noticed. That it is a medicinal agent capable of exercising a powerful, peculiar, and perhaps unexplained influence in arresting inflammation of the eye, as well as inflammation of other parts, seems to be now very generally admitted, and can scarcely be denied. It probably, however, acquired its character in this respect

from its effects in syphilitic iritis, which are unquestionably more decisive than in any other form. That iritis or inflammation of the eye may be removed by depletion and other general remedies, and that it may even cease or disappear without any medical treatment, must be admitted; but it must also be admitted, that its removal is accelerated and rendered more certain by the administration of mercury. In some other parts of the body inflammation may, perhaps, be encountered by general treatment only, or may be permitted to take its course and wear itself out without destructive consequences; but in such an organ as the eye, the construction of which is so exquisitely delicate, and the component parts so numerous, minute, and complicated, the changes produced by inflammatory action must be prevented by every means in our power, no matter what the risk may be of causing constitutional disturbance or any other mischief or inconvenience. The form in which it is to be administered, the quantity to be given, and the time for which it should be continued, must depend on the age, constitution, and peculiarities of the patient, the activity of the symptoms, and other circumstances. In common cases of simple uncomplicated inflammation, with foul tongue, defective discharges from the bowels and kidneys, I am in the habit of commencing with mercury in combination with a purgative and antimouial, giving about three grains of the blue pill with as much compound colocynth pill and an eighth or tenth of a grain of tartrate of antimony three times a day for a couple of days, then five grains of the blue pill with the same quantity of the antimony for about two days more, and finally five grains of the blue pill three or four times daily, adding a little opium if it continues to affect the bowels. This I generally find sufficient to produce the mercurial effect in six or eight days, and perhaps a more rapid introduction of

the mercury into the system is unnecessary or even injurious. Should the practitioner, however, consider a more decisive administration of the remedy necessary from the activity of the symptoms or the inactivity of this preparation, a couple of grains of calomel with quarter of a grain of opium, may be given every four or six hours, and beyond this I never find it necessary to go. The length of time during which the mercury should be continued or the exact quantity to be given, has not been determined by exact experiment, neither perhaps has it been ascertained whether or not this medicine exercises its peculiar specific influence without displaying its effects on the gums and salivary glands. In syphilitic iritis the inflammation generally begins to give way about the fifth, sixth, or seventh day, and is often subdued in another week; but in simple inflammation of the eye the effect is not so soon or so certainly produced. The safest course will therefore probably be, to give the mercury until the state of the gums or the state of the eye proves that it is causing its usual effects, and to continue its administration until the inflammation subsides, or until it is proved that perseverance is useless. It is scarcely necessary to say that it need not be given to the extent of producing ptyalism, but merely persevered in until its presence in the system is obvious; and if the inflammation yields without any tenderness of the gums or other mercurial symptoms, the surgeon may, perhaps, be satisfied without this evidence of the influence of the remedy.

An opinion seems to be entertained that mercury should be introduced more rapidly and in larger quantity than has been here directed, and some think that not a moment should be lost until the system is fully impregnated with it; but recollecting the danger to be apprehended from the sudden exhibition of large doses of the more active preparations causing irritation of the stomach and bowels

and disturbing the circulating and other organs, this opinion should be better considered. It should also be recollected, that unless a sore mouth and troublesome ptyalism be absolutely necessary, they should not be hastily or thoughtlessly produced; much distress and suffering being the consequence of want of caution in this respect. Every practitioner, however, has his own views on this subject, and I therefore make these observations more as suggestions than rules of practice. Mr. Lawrence, who may be considered one of the highest authorities on this subject, observes, with respect to the administration of mercury in iritis, that "after the loss of blood, either from the arm or locally by cupping and leeches, and after clearing out the bowels by purgative medicines, the use of mercury may be commenced; and the best way of employing it is in the combination of calomel and opium, two, three, or four grains of the former with one-fourth, one-third, or half a grain of the latter, every eight, six, or, in urgent cases, every four hours. In this plan of proceeding the influence of the remedy on the system will soon be perceived. Under particular circumstances, blue pill (*hydrargyrum c. creta*) or mercurial frictions may be employed instead of calomel. Two important questions present themselves, respecting the mode of conducting this part of the treatment; first, to what extent mercury should be used; and secondly, how long it should be continued. The more powerful its action on the system, the more effectually does it control the disease, putting a stop to the excitement of the capillary circulation, diminishing the size of the distended vessels, preventing the further effusion of lymph, and its organization into those new structures, which are so injurious to sight. Sometimes these ends are not accomplished by a slight action on the mouth, when a more powerful influence will quickly do the business. Full salivation, quickly pro-

duced, cuts short recent disease as if by a charm, the remedy may then be suspended, and its effects allowed to subside slowly, which will take two or three weeks : it will not be necessary to give any more mercury." I quote Mr. Lawrence's words, because they embody the opinions of an eminent and experienced surgeon on this subject, but I still think that the salivation has nothing to do with the amendment, and that it is of no value except as evidence of the full influence of the medicine on the system. Mr. Lawrence also observes—"Two opposite opinions are entertained respecting the comparative efficacy and advantages of the simple antiphlogistic, and the mercurial treatment of iritis. Some, placing unlimited confidence in the powers of mercury, assert that the mercurial action *alone*, when properly kept up, is sufficient to subdue the ophthalmia iridis in its most acute stage ; while others, dreading the injurious effects of the remedy on the constitution, discard it entirely in these cases, believing that other antiphlogistic means are capable of accomplishing all that is required. I cannot adopt either of these views. Although mercury alone, or at least in conjunction with purgatives and restricted diet, will often cure iritis, I have seen many instances in which the sufferings of the patient have been protracted, and the organ has experienced serious injury from the continued progress of the inflammation, when the use of mercury has not been preceded or accompanied by the loss of blood. The practical conclusion therefore at which I have arrived after ample experience of the complaint under every variety of treatment, is, that iritis generally, and the syphilitic form of the complaint particularly, will be most advantageously treated by the successive or combined employment of antiphlogistic means and mercury ; that this plan will give the quickest relief, will most effectually arrest the inflammation, restoring the iris to its healthy structure and

functions, and will afford the best security against the return of the disease." Mr. Lawrence, however, reminds the practitioner that mercury must not be employed indiscriminately, and that in weak or strumous constitutions it will often disagree, and the effect on the local disease will not be produced. Where this is to be feared he prefers the *hydrargyrum cum creta* as the mildest and most eligible form. That mercury is a valuable remedy in the acute stage of inflammation of the eye, is, as I have said, admitted; but whether equally so in the more advanced stages, although generally resorted to in such cases, appears doubtful. When the disease has been neglected for some weeks, and the increased vascularity of inflammation is still remaining, it should, I think, be administered, and will often prove beneficial; but after the lapse of some months, and when all redness has disappeared, it generally proves useless. At this period it is not inflammation in any stage which we have to encounter, but the consequences of inflammation, adhesions, opacities, thickenings, and other forms of disorganization. These, I fear, are not to be removed by this or any other remedy; although they may become less injurious to vision in time. Adhesions of the iris to the capsule of the lens may become elongated, and opacities of the membrane of the aqueous humour covering the front of the capsule of the lens may be diminished; but vision lost from change of structure of the retina cannot, I fear, be restored by mercury or any other remedy; nevertheless the patient should perhaps have whatever benefit it is capable of affording, especially if it has not been already tried. I am more frequently than I wish called on to treat such cases, the poor of this country very often allowing inflammation of the eye to proceed to destruction of sight without seeking relief: and although I generally give a trial to mercury and other powerful remedies, I seldom succeed in restoring

vision. The great mischief is the amaurosis from disorganization of the retina, and this disorganization cannot be remedied. As to the local application of mercury in the shape of a lotion of corrosive sublimate, or frietion with mercurial ointment, I attach no value to it; mercury to produce its peculiar effects must be carried into the circulation by absorption. The influence of mercury in arresting inflammation of the eye is one of the most important facts in the history of medicine, and yet we are not perhaps able to say to whom the discovery of its properties in this respect are to be attributed. Employed empirically, as it has been in almost all diseases, its effect in this must have been occasionally observed, and has been incidentally noticed by authors; but until Dr. Beer of Vienna, in his *Bibliotheca Ophthalmica*, published in 1799, declared that no remedy is so efficacious in acute inflammation, or so capable of preventing effusion or opacity, it was not considered to have so decisive an operation. Subsequently, Dr. Farre, in the second edition of Mr. Saunders' Treatise, stated, without perhaps being aware of the opinion expressed by Dr. Beer, that after a fair trial he was perfectly satisfied that mercury alone is sufficient to subdue iritis in its most active stage; and that it operated, not merely as a specific in syphilis, but as a powerful agent in altering the action of inflamed arteries and controlling the effusion of lymph.

Whether or not in simple uncomplicated inflammation of the eye any other remedies than those above enumerated are required, or if required, are to be relied on, remains to be considered. That there are some which may, and probably do, exercise a direct influence in reducing or arresting inflammation, may perhaps be conceded, but that any of them in ordinary cases should be substituted for mercury is questionable. Iodine, turpentine, colchicum, and bark, are valuable remedies, where the

inflammation is modified by specific disease, or general constitutional derangement; or where mercury has already been given, or cannot with safety be used; but in a recent acute attack, occurring for the first time in a person of otherwise good health, they are scarcely to be relied on in preference to bleeding, mercury, and the other means noticed. In fact, the powers of these remedies have scarcely been fairly tested in consequence of the reliance placed in depletion and mercury: they have been generally reserved until the others have failed, or they have been adopted because the others have been found inadmissible. That mercury arrests inflammation of the eye by some peculiar influence which it exercises in the animal economy, of the nature of which we are ignorant, appears to be proved; but it remains to be proved that any other remedy is capable of effecting the same object. That there are such is very probable, and experience and observation justify us in concluding that they have been successfully applied, but they have not been so rigorously tested that we can adopt them implicitly. The remedies to which I allude being, however, resorted to more in those cases in which the inflammation is caused or modified by some other disease or constitutional disturbance, I will reserve the observations to be made respecting them until I come to treat of such modifications.

With respect to local applications, the practitioner often experiences much difficulty in determining their value, or the circumstances under which they should be employed, so inveterate is the habit of resorting to them in all diseases of the eye, and so strong are the prejudices in their favour. If the successful treatment of the disease was the only consideration, the advantage of making any application to an inflamed eye might be questioned, but as patients generally expect to have such made, and often

wish for them, we should be prepared to gratify them. In my own practice, unless there be pain, I prefer, in cases of simple inflammation, to leave the eye untouched and uncovered, relying altogether on general constitutional treatment ; but if there be pain or even uneasiness, I allow the use of a warm stupe, being in fact heat with moisture. I direct a small sponge in the shape of a cup, or a scrap of flannel, which, from its elasticity, unfolds after compression, to be squeezed out of warm water, and held under the eye, and touching the eyelids, in the hollow of the hand, until it begins to cool ; and this is to be repeated until the patient is either relieved or satisfied. Exposure of the eye to steam rising from a vessel of boiling water I do not recommend, because I cannot see any reason for the practice ; and have not observed it to be beneficial in its operation. If a patient be suffering severe pain, we may be justified in making trial of such means with the hope of relieving it, but exposing the eye to a temperature of 200 degrees or more, to reduce vascular turgescence, seems an unintelligible proceeding. Covering up the part with any dressing or poultice, seems equally unintelligible : they cause pressure by their weight, or the tension of the bandage, and heat, by acquiring and retaining the temperature of the surface on which they rest. The surgeon should have some principle to guide him in his practice in this respect, for it cannot be a matter of indifference whether or not he keeps the part moist or dry, hot or cold. If he determines to keep the eye cool he will recollect that its temperature is 98 deg., while the air of the room is 50, 60, or perhaps 70 ; and that by exposing it uncovered he secures whatever amount of cooling this difference affords, with little or no variation. If he wishes to keep the surface moist, and this is generally agreeable and is probably beneficial, he should reduce the temperature by evaporation and the appli-

eration of a better conductor of heat than the surrounding air. With this view, when I find so much uneasiness or pain that relief is called for, I lay a single layer of soft old linen moistened with water over the eye, first bringing it to the temperature of the skin by laying it for a short time on the palm of the hand, and this I cause to be renewed from time to time in the same way ; taking care that the old linen is not in any way secured over the eye, but left loose, in order that it may fall off when it dries during sleep. Should it be considered desirable, notwithstanding these considerations, to keep the surface moist and at the same time in contact with a material of the same temperature, a wetted fold of old linen covered with a layer of oiled silk may be applied, or even a thin layer of boiled bread and milk made into a soft and smooth poultice ; interposing a layer of thin muslin between the poultice and skin, and covering the whole with a layer of oiled silk to prevent it from becoming dry. I never, however, resort to this dressing except after severe injury, or where there is suppuration. Whether or not in simple inflammation of the eye, without much pain, sedative or narcotic additions should be made to the water used for the dressing above alluded to, is not perhaps determined, but as they probably do no harm, and secure more care in the application, by causing the patient and attendants to repose confidence in their medicinal virtues, they may be permitted. Infusion of poppy-heads, or any combination of opiate preparation which the practitioner may find convenient, will probably answer. In making these observations respecting local applications, I wish it to be understood that I offer them more as hints than as rules to be strictly adhered to. Every surgeon has his own methods and favourite formulæ, and all I aim at is to induce him to apply them in accordance with correct principles.

The application of the extract of the atropa belladonna

is called for in inflammation of the eyeball, not merely on account of its sedative or narcotic properties, but in consequence of its peculiar influence in causing dilatation of the pupil. To what proximate cause this most remarkable and still unexplained effect is due, cannot here be determined, but that it produces this result is undeniable, and therefore is it to be valued as a remedy. Of all the injurious effects or consequences of iritis the most frequent is adhesion of the iris at the margin of the pupil to the capsule of the crystalline lens, and to prevent this every effort should be made. I have already expressed my belief that in a perfectly formed eye at the earlier periods of life the margin of the pupil touches the capsule of the lens when the aperture is contracted, or even in its ordinary state between dilatation and contraction; it follows therefore, that if these surfaces become inflamed, adhesion between them will probably take place, and experience proves that it does so. From the very commencement therefore the extract should be applied, and should be continued until the inflammation subsides. It should be mixed with water until it acquires the consistence of paint, and will flow from a camel hair-pencil without running off from the skin, and should be freely applied to the eyelids, brow, and upper part of the cheek. I generally paint the surface twice, allowing the first application to dry before I make the second, and thus I secure a sufficient quantity in close contact with the skin. I then, when it adheres, lay a scrap of damped old linen over it to keep it moist; because I believe that its effect is more certain and powerful when in this state than when dry, and I direct a lotion of one or two drachms of the extract to eight ounces of water to be used to moisten the fold of old linen from time to time for an hour or two, and even continue the application as a cooling lotion if the patient feels it agreeable. If, however, local applications

are not found comfortable, or do not appear to be useful, the belladonna need not be applied more than once, or at most, twice in twenty-four hours; because its effect on the iris continues for a day at least, and sometimes much longer. It is also sometimes necessary to restrict its use to a daily application in consequence of its causing irritation of the skin, or even slight excoriation or eruption. When this happens, I apply it once a day, as described, and after an hour, have it carefully washed off with a large camel hair-pencil or very soft sponge, smearing the surface when dry with cream. It should be recollected that in some persons, and especially in the aged, the effect is not produced on the pupil by the application to the skin, probably in consequence of the cuticle being too thick or harsh. When I apprehend this, I use the remedy more freely, and keep it on longer in a moist state. It is also to be recollected that the belladonna will dilate the pupil when applied to the conjunctiva, while it has little or no influence when applied to the skin. Keeping this in mind, I sometimes venture, even during inflammation, to drop a fluid extract between the lids, which of course causes some irritation, but perhaps does little if any mischief, while it promises benefit by securing the dilatation of the pupil, and thus preventing adhesions. As this narcotic locally applied is often found to allay pain, especially in neuralgic affections, there can be no objection to its use in inflammation of the eye, and therefore it may be used, although it should not cause dilatation of the pupil. I have already stated that in the early or acute stage of severe inflammation the iris loses its power, and the pupil not only ceases to act, but is unaffected by the application of belladonna; I do not, however, discontinue its application on that account, because as soon as the inflammation is reduced, it begins to produce its effects, and either prevents adhesions, or if they have been formed

stretches or ruptures them. It may perhaps be supposed that too much importance is attached to the use of belladonna in inflammation of the iris and its consequences; but when it is recollected that contraction and adhesion of the pupil so frequently take place during its progress, and cause so much defect of sight, such a powerful means of preventing them should not be undervalued. That it often fails to effect this object in consequence of the immobility of the iris during the acute stage, cannot be denied, but as it begins to operate when that stage is passed, and as it does no harm, there can be no reasonable objection to its use. After the inflammation has entirely disappeared, and that vision remains much impaired, in consequence of a contracted and adherent pupil, the greatest benefit is often obtained by the use of this agent. It not only causes temporary improvement of vision by enlarging the contracted pupil, but permanent amendment by stretching the adhesions. It even sometimes, when the adhesions are few and very slender, ruptures them; although less frequently than is perhaps generally supposed. To effect this object at this period I always apply the belladonna to the conjunctiva, as one drop of fluid extract used in this way is as effectual, if not more so, than a large quantity of the extract smeared on the eyelids. The extract itself softened with water, or even a watery solution of it, will answer the purpose, but as it contains insoluble matter which forms a clot between the lids, a purified preparation should be preferred. It may be rubbed up with a little alcohol to coagulate the albumen contained in it, and then with water in sufficient quantity to render it so fluid that the insoluble matters will subside; or the atropia itself, or some of the salts of it, may be used in solution. I have obtained a solution of two grains of nitrate of atropia in one ounce of water from Mr. Donovan of this city, which causes full dilata-

tion of the pupil with very little irritation of the conjunctiva. When the belladonna is applied to stretch the adhesions of an adherent pupil, and to enlarge the contracted opening for the admission of more light, after inflammation has disappeared, it should be used once at least in twenty-four hours. I prefer using it in the morning, because if applied at night the effect is diminished before the next day when it is most required. If the object be to stretch or break recent adhesions, it may be used both night and morning. After having been dropped into the eye, the lids should be closed and light excluded for twenty minutes or half an hour. In the sound eye of a young subject the pupil dilates in twenty minutes or half an hour, and continues dilated for twenty-four hours, and sometimes for two or three days or more. The practitioner should be careful in his selection of this medicine, as it is frequently found inert and worthless in the shops, or an extract obtained from some other plant is substituted for it. Even the genuine extract is found presenting very different characters, although the different kinds may be equally active. There is a firm, green, friable extract, which is very liable to mould and form crystals within it, which is very inconvenient for use, but which is I understand prepared with care. This I do not use when I can procure another, which is of a rich brown, like tar or treacle, and adhesive and tenacious; not drying rapidly, or when laid aside, becoming hard and mouldy. In concluding these observations respecting the use of this medicinal agent in the treatment of inflammation of the eye, it should be remarked that its use requires some discrimination and judgment. as the pupil sometimes when fully dilated by it, either after inflammation or operation, and so continued for some time, never recovers its original dimensions, but remains permanently enlarged, causing defective vision and defor-

nity. When I apprehend this result from unusual dilatation of the pupil, I discontinue the belladonna for a day or two, or apply it occasionally only, to ascertain whether or not adhesions are forming. If after the inflammation subsides, the pupil remains free and active, no application of the kind is necessary. It is scarcely necessary to remind the practitioner that dilatation of the pupil, whether caused by belladonna, or the result of disease, as in the state called mydriasis, is accompanied by very defective vision, objects are indistinct, and there is a sensation as if a haze or cloud was interposed, which is so inconvenient and often alarming to the patient that if caused by belladonna it must therefore be discontinued.

The value of blisters in inflammation of the eye, notwithstanding their frequent and often indiscriminate use, does not appear to be fully ascertained. It is even doubtful whether they are of value at all, and some go so far as to say that they are mischievous. That practitioners so frequently resort to them is no evidence of their beneficial influence ; it is only evidence of the existence of some vague notion of their value, entertained from the conviction that they are useful in inflammatory affections in general. This state of uncertainty is only the consequence of that imperfect method of testing the value of remedies which affords so little of exact information in practical medicine. Blisters do not appear to be of any use during the acute stage, and are probably injurious by increasing the irritation, both local and general. It is after that stage has subsided, and while its consequences, increased vascularity and exalted sensibility remain, that producing inflammation and its consequent pain and vascular turgescence, in the vicinity, can be resorted to with any prospect of advantage. It is an attempt on the part of the practitioner to cause a metastasis of the disease from an organ liable to suffer irreparable injury from its continuance there, to a

structure not liable to suffer any such serious alteration. How far this can be effected, is, as I have said, doubtful, but as the attempt does not appear to be attended with injurious consequences, it may be made. The place to which the blister should be applied requires consideration. The temple, the skin behind the ear, and the nape of the neck, are the parts generally selected; but if any advantage is really expected from the remedy, the practitioner must admit that the choice of the place of application cannot be a matter of indifference. The question to be decided is, whether the impression should be made on a surface supplied by the same nerve of general sensation as the eye, or on some surface more remote and supplied by nerves from a different source. If to be made on the branches of the same nerve of sensation distributed to the eye, the application should be to the forehead, over the place to which the frontal branch of the ophthalmic division of the fifth pair is distributed, if to a surface deriving its nerves of sensation from other sources, the nape of the neck may be chosen; or rather the back of the head, a little above the neck, to avoid the discomfort which attends a blister in this situation from motion or the recumbent position. It may be suggested that this inflammation of a portion of the skin in the vicinity of the eye does not exercise its influence on the disease through the nerves at all, and such suggestion is obvious, when it is found that precisely the same influence is put in requisition to produce a state of excitement or activity of function either vascular or nervous; as when we blister to restore the impaired or suspended sensibility of the retina in amaurosis. In the one case we blister to reduce the vascular turgescence and allay the exalted sensibility of the organ, in the other to produce an effect altogether the reverse. To escape from this difficulty it may be argued that the entaneous inflammation, thus artificially produced,

operates beneficially by diverting the current of blood to another situation in the vicinity, or by causing a discharge or drain, as it is called, which serves to carry off something superfluous or pernicious. Theory in fact does not support the practice of blistering in inflammation of the eye, and experience, notwithstanding its extent, does not decide the question. In my own practice I generally reserve blisters, sinapisms, stimulating liniments, and irritating ointments, until the disease assumes an intermitting or neuralgic character, or until the inflammation ceases to display symptoms of activity and becomes languid or stationary. I also rely on them more to aid other remedies in arresting or diverting the relapses or periodical returns of such attacks, which are sometimes most distressing and destructive.

Evacuation of the aqueous humour by a puncture or incision at the margin of the cornea has been recommended by Mr. Wardrop in inflammation of the eye, and Dr. Mackenzie says that it is "in certain cases an invaluable remedy." I cannot, however, admit that such a measure should be resorted to. The eye, even in a state of inflammation, may perhaps escape serious injury from the practice, and it may be restored to its original perfection notwithstanding such injury, but the probability is that the proceeding will exasperate the disease and add greatly to the danger of permanent injury. The suggestion seems to have been made from a presumption that the aqueous humour and other fluids within the eye become increased in quantity and cause distension and consequent pain, but there is no proof that any such change takes place, and even if it does, the relief can be but temporary, as the fluids must again accumulate in a very short time. It is not perhaps necessary to say more on the subject, as the proposal has not been generally adopted, but I considered it necessary to object to it lest the authority of a writer

to whom surgery is so much indebted should lead inexperienced persons to attempt what they might find difficult to perform, and doubtful in result.

INFLAMMATION OF THE EYE FOLLOWING FEVER.

THAT inflammation of the eye sometimes follows fever and is to be attributed to that state of the animal economy which fever engenders, cannot be denied; because we have the most direct and positive evidence that such inflammation has been observed in numberless cases of persons who suffered from epidemic fever in this country and in Scotland. Whether this inflammation of the eye takes place as part of a general disease affecting the whole system, or only as a consequence of exposure to cold while the system is enfeebled by the effects of fever, cannot perhaps be determined; but that it does occur under such circumstances is certain. The following essay on the subject was communicated by me to the Association of Fellows and Licentiates of the College of Physicians of Ireland in January 1828, and was published in the volume of their Transactions for that year:

“The occurrence of a local inflammation of specific character, as a consequence of fever, is a fact of importance not only to ophthalmic surgery, but to pathology generally.

“That iritis, or internal inflammation of the eye, is one of the sequelæ or consequences of that form of fever which afflicts this country, was first established by Mr. Hewson in his work on Venereal Ophthalmia, and the fact is now fully admitted by the profession in this city. Having myself met with seventy or eighty examples of this disease within the last year, I am induced to communicate the results of my inquiries respecting it.

“I am unwilling to apply the term iritis to this affection.

because I do not believe that the iris is the part primarily or exclusively attacked; but on the contrary, that all the internal parts of the eye participate in the inflammation, especially the retina, as proved by the symptoms to be presently detailed. Even in syphilitic iritis the inflammation is not confined to the iris, but extends to the membrane of the aqueous humour, the sclerotic coat, and cornea, and if not checked, finally to the lens, vitreous humour, and retina. The use of the term has the effect of directing the attention of the practitioner to the iris, which bears a great deal of inflammation without destruction to the organ, and withdrawing it from the retina, which bears very little without permanent injury to vision, I therefore call the disease Internal Inflammation of the Eye.

“ That this inflammation is to be considered one of the consequences of fever I do not entertain a doubt, because in all the cases which I have met, the patients had suffered from fever during the preceding six or eight months, and in one or two instances only the previous existence of fever was doubtful. The conclusion can be disproved only by supposing that so great a proportion of the population had gone through fever within that period, that few had escaped to afford examples of the disease occurring independent of such cause. My experience leads me to believe that this affection occurs much more frequently in young than old persons; I have no case noted of its occurrence at a later period of life than forty-five; and of thirty cases in which the ages have been noted, three only are above twenty-five. I believe, also, that it is much more frequent among the poor than the rich, and therefore is probably to be referred to exposure to cold, and to insufficient nourishment after recovery. It likewise may perhaps be considered to arise more frequently among females than males; neither are children exempt from it, as I have met with cases at three, five, and seven years of age. I have not found that the practice of any particular trade disposes to it. The inflammation, in the majority of the cases seen by me, made its appearance within six weeks or two

months after recovery from fever ; in some instances, however, it appeared before the patient left the hospital, and in others not for four, five, or even eight months. Both eyes are seldom affected ; I do not think that I have met a case in which more than one was attacked.

“ The inflammatory symptoms are generally preceded by those defects in vision which are considered to arise from disease of the retina, such as *muscæ volitantes*, clouds, and luminous coils or stars. These, in most instances, had not existed for more than six, eight, or ten days previous to the appearance of inflammation ; but in some they had existed for two months, commencing immediately after recovery from fever. The accounts given of these first symptoms were, that the sight began to fail so as to disable the patient from working at his trade ; that a black fog, cloud, gauze or scum, came before the sight ; that vision became dim, spread, or dazzled ; or that there were motes, threads, stars, or flies dancing or swimming before the eyes. The inflammatory stage is distinguished by the increased vascularity, the cloudiness of the transparent parts, alterations in the condition of the iris, pain, intolerance of light, increased secretion of tears, and defect of vision.

“ The vascularity produces the same appearances which have been observed in other forms of internal inflammation and iritis ; at its commencement a pink zone surrounding the margin of the cornea ; at a more advanced period vessels converging from the lateral parts of the globe to the cornea. The pink zone in the sclerotic, or tunica albuginea, arises from the enlargement of the capillary vessels of the sclerotic at this part admitting red blood, which vessels in a state of health, we conclude, carry transparent blood only. The larger distinct vessels, which appear at a more advanced period converging to the circumference of the cornea, and obscuring the white of the eye, are the branches leading to those capillaries, and as they do not ramify so extensively, or form the same reticulated arrangement as those of the conjunctiva, they afford a good means of distinguishing

inflammation of the globe, or its parts, from inflammation of the conjunctiva. Diagnosis, founded upon the condition of the vessels alone, is not, however, to be relied upon, because there is frequently so much conjunctival inflammation accompanying the internal derangement that this vascular arrangement is obscured. It is to be remembered that this must also be the condition of the vessels in inflammation of the sclerotic or cornea, from whatever cause it may arise. I have repeatedly observed it in wounds, ulcers, and abscesses of the cornea.

“ In this inflammation the transparent parts are rendered more or less clouded or opaque; the cornea especially has its margin or circumference almost always of a whitish or gray appearance, presenting an opaque circle resembling the *arcus senilis*. The anterior chamber of the eye appears clouded, independent of the opacity of the cornea, arising probably from thickening of the membrane of the aqueous humour; this cloudiness is sometimes general, sometimes it presents a muddy patch behind the cornea, as in syphilitic iritis. In the worst form of the disease the lens itself becomes partially opaque, reflecting light falling obliquely upon it, and presenting an opaline amber colour; indeed it is in this way I have observed vision to be destroyed where the disease has been fatal to the organ. The hyaloid membrane of the vitreous humour may possibly participate in this opacity.

“ The iris is always altered in colour, the brilliancy of its tints being totally lost; it never, however, acquires the decided yellowish-green observed in syphilitic iritis; neither have I observed the abscesses or tubercles, usually called globules of lymph, which characterize that form of inflammation; purulent matter is, however, occasionally secreted in the anterior chamber of the aqueous humour, constituting hypopion, or unguis. I have not observed that the secretion of purulent matter was a consequence of more intense inflammation; on the contrary, I have seen it in very mild cases, and even where the pupil contracted on exposure to light.

The pupil is generally slightly irregular, but I have not observed that it contracts adhesions to the capsule of the lens, or that it becomes closed as in iritis; in many well-marked cases I have found it contract on exposure to light with considerable activity.

“The patient generally complains of a stinging or aching pain darting to the temple or nose, but in many instances there is little or no suffering from this cause. Intolerance of light, and even severe pain on exposure to any strong glare, is almost always present. The answer to the first question respecting the pain is, that it is produced by the sun, the candle, or the fire. When there is much intolerance of light there is considerable secretion of tears, which produces a distressing scalding sensation.

“Vision is in all cases much impaired; some cannot read print of moderate size, others cannot distinguish large capital letters, others are unable to see a key or other large object held at a short distance from the eye, while others can only distinguish light from darkness. I have not observed that the degree of injury to vision was proportioned to the extent of the inflammation; the cases of mildest appearance being sometimes attended by the most defective sight. The patient can seldom distinguish all the prismatic colours. deep blue and green generally appearing black.

“The following history of one well-marked case affords a summary of the preceding detailed symptoms. The patient states that he recovered from fever two months ago, and returned to work at his trade as usual; that about three weeks ago his sight became dim, his work confused by motes or flies floating before his eyes, and that a few days ago the eye became red and sore. He complains of pain in the eyeball, extending to the temple, and suffers from exposure to sunshine, fire, or candle. He cannot read small print, or tell the hour by a watch. His eye feels hot, and there is a considerable discharge of scalding tears. The sclerotic is highly vascular, and the larger vessels converge to the circumference of the cornea, which is surrounded by a pink

zone. The cornea is slightly clouded, the margin forming a whitish circle resembling the *arcus senilis*. The anterior chamber of the eye appears clouded, independent of the cloudiness of the cornea. The iris is altered in colour; the pupil is slightly irregular, acts sluggishly, or is nearly immoveable. The crystalline lens is often clouded, of an amber tint, and opaline appearance; and vision is permanently impaired, or totally lost, with dilated pupil, and other symptoms of perfect amaurosis. When the inflammation subsides, and the disease terminates favourably, the symptoms gradually disappear; the purulent matter, if secreted, is absorbed, and the iris recovers its colour; the pupil becomes regular and active, and vision is perfectly restored. An imperfect recovery is sometimes obtained, leaving defective vision, *muscæ volitantes*, and other amaurotic symptoms.

“The treatment of this inflammation of the eye is not attended with much difficulty. Bleeding, locally or generally, in proportion to the urgency of the symptoms; blistering, where there is much pain or intolerance of light; purgatives, antimonial medicines, and opiate stupes, are obvious means of relief. I am in the habit of using the extract of belladonna very freely, not only in this form of inflammation, but in every other, and more especially in syphilitic iritis, where there is so great a tendency to closure of the pupil and adhesion of its margin to the capsule of the lens. In the contracted state of the pupil, its margin, at least when inflamed, is in contact with the capsule; but when dilated it is altogether detached from it, and consequently cannot adhere. It must, however, be admitted that the iris, when much altered by inflammation, is not affected by the belladonna; but even under such circumstances, its use is not attended with any disadvantage. But it is not from its effect on the pupil alone that the extract of belladonna should be applied; very decided relief is obtained from its application in those cases where there is deep-seated pain, extending from the eyeball to the temple, and especially in rheumatic inflammation. It

may be used, as recommended by Beer, in the form of ointment, rubbed in upon the temple, (half a drachm of the extract, with an equal quantity of mercurial ointment every night,) or the extract alone, softened with water, and daubed over the lids and brow, and kept moist for one or two hours with a light fold of old linen wetted every ten minutes, may be preferred. I do not, however, by any means recommend that the surgeon should depend upon these remedies alone; on the contrary, I believe that they will prove ineffectual in the majority of cases, and therefore we must have recourse to mercury, which has been found so valuable a resource in other cases. In my own practice I have found the relief from the use of mercury so certain and decisive, that I have trusted to it almost exclusively, with the assistance of the belladonna, I have generally found that two grains of calomel with a quarter of a grain of opium, three times a day, answered every purpose; and in the majority of cases I produced the necessary mercurial action, as marked by tenderness of the gums, in eight or ten days, by the use of three, four, or five grains of blue pill alone, three times a day; and if the pain should be severe, combining hyoseyamus or belladonna with the dose taken at bedtime.

“I have heard that the sulphate of quinine has been administered with advantage in those cases; but as my experience of its efficacy is not considerable, I cannot speak of it with any certainty. In two cases which I met after the inflammation had subsided, and in which vision was as much impaired as if no remedies had been adopted, bark in powder had been administered for ten days. I gave trial to the sulphate of quinine myself in four well-marked cases for eight days, but finding no relief, had recourse to mercury, which effected a cure in the usual time. I have no doubt that many of those cases, when the inflammation is not severe, recover without any treatment. I have met with several complaining of *museae volitantes*, and other slight amaurotic symptoms, who, upon being questioned, stated that they had slight sore eye after recovery from fever. Of

the value of sulphate of quinine as a remedy in most forms of ophthalmia, when occurring in debilitated or scrofulous subjects, or after long confinement in an unwholesome room, or after the injudicious use of mercury, I am fully aware; and I know of no curative means which merit more the attention of the ophthalmic surgeon."

At very nearly the same time that my communication was before this association, the late Mr. Wallace of this city read a paper on the same subject before the Medico-Chirurgical Society of London, the object of which was, to establish that this inflammation of the eye could be removed by bark or quinine, and that he had, in fact, succeeded in all cases in removing it by this remedy. The cases quoted, however, do not support this statement. Seven recorded as severe examples of the disease cured by bark or quinine had all been previously treated by mercury, and were, in fact, brought forward as cases "in which mercury had been employed in vain." Such cases, however, are totally inconclusive as evidence to prove that this particular form of inflammation of the eye admitted of cure by quinine. Every man who has seen much of general inflammation of the eye, commonly called iritis, must have observed that in many cases, and even in syphilitic inflammation, the redness, pain, and defective vision continue, notwithstanding the administration of mercury; or that after having been removed, these symptoms return on exposure to cold or wet. In such cases, however, few, I believe, resort to mercury again, at least for some time, but rely on remedies which have been found useful under such circumstances; such as iodine, turpentine, colchicum, and bark. How or why these remedies, so dissimilar in their nature, produce beneficial effects, we know not; but I think that it can scarcely be denied that sometimes one, and sometimes

another, is found useful in this state of things ; and I have no doubt that the amendment, attributed to the bark in these cases by Mr. Wallace, such as it was, was of this description, and such as we every day see under similar circumstances. The view I myself take of the matter is this—I consider that the destructive inflammatory action is arrested by the mercury, and by depletion, if resorted to, but that the vascularity or enlargement of vessels and with it more or less of pain and defective vision necessarily still continue ; as do also changes in organization, such as discoloration of the iris ; cloudiness of the chamber of the aqueous humour ; contraction, irregularity, and adhesion of the pupil. This surely is in accordance with our views of inflammation in general. We do not assume that inflammatory action still continues, because parts remain still red, tumid, hard, and painful. We have to distinguish between inflammation and the consequences of inflammation ; and in inflammations of the eye we have to do so particularly. I therefore consider that when the inflammation appears to linger, or that it does not appear to yield to the usual remedies, we, in fact, have the consequences more to contend with, and hence the advantage of remedies influencing the functions of secretion and nutrition, and of such change of diet as will restore the frame to its naturally healthy state, after having been disturbed by powerful remedies and denial of food : hence, therefore, the value of bark under such circumstances, and hence its supposed specific influence in arresting inflammation. For my own part, I am so satisfied that this is the principle upon which we should proceed, that I often place as much reliance on generous diet, in moderation, and on improvement, as to means of pure respiration, as I do on the remedies above alluded to. At the same time I would not have it understood that I deny that bark in certain cases exercises an influence on inflammatory action

so peculiar that it may be called specific. I will allude to such cases presently ; but I do deny that inflammation fairly established, and causing change of structure, disorganization, and permanent interruption of function, such as intense redness, loss of transparency, effusion of lymph or purulent matter, adhesion, contraction, fixed pupil and blindness, should for a moment be left to the influence of bark or any such remedy.

That transient inflammation of the eye or of any other part, arising from some state of the system in general, which we do not well understand, or of some important organ in particular, may be removed by bark or other remedies exercising influence on nutrition or secretion cannot be denied : and if not, it is probably equally true that inflammation from similar causes, which might otherwise become established, may be arrested at its commencement by the same means. This will explain the statements made respecting the cure of the inflammation in question by bark, in certain cases, but it will not explain the statements made by Mr. Wallace of perfect cures effected by the same remedy where great disorganization of the eye had taken place. I have stated in the communication above reprinted, that "in my own practice I have found the relief from the use of mercury so certain and decisive that I have trusted to it almost exclusively ;" and again, that "I gave trial to the sulphate of quinine myself in four well-marked cases for eight days, but finding no relief had recourse to mercury, which effected a cure in the usual time." All this I am sure was true, because the paper was written at the moment I was engaged in the inquiry, and I should have been as well satisfied to have removed the complaint by one remedy as another. I would also have it understood that I am not at all an advocate for the exclusive or indiscriminate use of mercury in inflammation of the eye. On the contrary, I am

convinced that it is often unnecessarily and injuriously resorted to when other remedies might have effected a cure. In those cases which appear to be of a gouty, rheumatic, or neuralgic character, and in which the inflammation returns once, and sometimes twice, every year, for several years, I never begin with mercury, and sometimes do not give it at all (although the disease may continue for three or four weeks) if the patient has been subjected to repeated mercurial courses in former attacks. I generally commence by giving a smart purgative composed of compound colocynth pill and calomel, to remove the contents of the intestines, and with the hope of stimulating the liver to secretion. I then, keeping the patient in bed, give antimonial medicine in such doses and at such intervals as will affect the skin without producing nausea; at the same time applying some leeches over the cheek-bone if the patient's strength admits of it, and thus sometimes cut short the attack; or, according to the peculiarities of the case, and the previous history, I resort to turpentine, as suggested by Mr. Hugh Carmichael; or to colchicum, if the patient exhibits symptoms of gout or rheumatism; or to the hydriodate of potash, if the constitution appears serofulous: or, if the pain be of neuralgic character, with or without intermissions, bark or quinine is given. I mention this here, and perhaps somewhat out of place, because I want to prove that there is nothing very wonderful or unusual in the administration of bark in certain forms and at certain stages of inflammation of the eye; and in stating as I do above, the course I pursue in complicated and untoward cases, I only state what well-informed practitioners all do under similar circumstances. I can with certainty point out cases which I have ventured to treat for three or four weeks without a grain of mercury, and which recovered as completely as on former occasions, in which salivation had been induced; such cases having

been exceedingly severe and alarming, with intense redness, severe pain, and intolerance of light, and total blindness. Last year I attended one of them with another practitioner, in which guaiacum was at his suggestion principally relied on. This was perhaps the twenty-fifth attack to which this gentleman had been subjected, and was of distinct neuralgic character, with regular intermissions, and most distressing intolerance of light. With the state of this gentleman's eyes I was well acquainted. The pupil adhered to the capsule of the lens in both eyes, and was contracted and irregular, and the capsule at the place of adhesion was opaque, so that a very small aperture only remained for the transmission of light. After this attack I examined the eyes carefully, and was agreeably surprised to find that they had suffered very little from it; vision was not quite so good as before, and perhaps the opacity of the capsule had extended a little, but this was so soon after his recovery that I attributed the increased defect to temporary causes.

We have now to return to the subject of this particular inflammation of the eye following fever. It appears that an epidemic fever prevailed in Glasgow during the greater part of 1843, closely resembling, if not identical with, that which prevailed in Dublin in 1826, and it is very instructive and remarkable that this fever was followed by inflammation of the eye similar to that above described by me. Of this fever, with this its consequence, an excellent account was given by Dr. Mackenzie in the *London Medical Gazette*. The title of *Post-febrile Ophthalmitis* is given by him to this inflammation of the eye, and I suppose that it may with convenience and safety be adopted in nosological systems, especially if we can say that the disease presents distinct specific characters; although perhaps we have already too many varieties, and even symptoms and consequences of diseases of the eye

described under particular names, as if they were generically or specifically different from all others. Dr. Mackenzie relies much on Mr. Wallace's description of the disease as it appeared in Dublin, but I am very much inclined to think that that gentleman saw very little of it. In fact the inflammation differs little from other inflammations of the eye ; it is its occurrence as a consequence of this particular form of fever which is remarkable and instructive as a pathological fact. As in all other cases, so in this, the sclerotic becomes red, the iris discoloured, the transparent parts cloudy, the pupil opaque, and the retina more or less insensible ; and if the disease proceeds unchecked, it ends in closed or contracted and adherent pupil, cataract, and that total destruction of the organization and functions of the retina called Amaurosis. As to treatment, Dr. Mackenzie recommends depletion, even where "the wan appearance of the patient, a small pulse, and general debility, might tend to deter from a use of the lancet." In the cases treated by me after the Dublin epidemic I did not bleed, except occasionally by leeches, so that there must be some difference as to constitution between the sufferers in Dublin and Glasgow. I have already stated my opinion as to the necessity or advantage of bleeding in inflammations of the eye, and have argued that it has been relied on oftener than it deserves. Dr. Mackenzie gives a decided opinion in favour of mercury, and places little reliance on bark.

Dr Anderson of Glasgow, has given an elaborate account of this disease in the *London and Edinburgh Monthly Medical Journal* for last October, and has described the symptoms and consequences with great minuteness. He says that of one hundred and thirty-five cases, ten began during the fever or its relapse ; one or more relapses being the characteristic of this fever. Thirty-four began at

once upon convalescence, and twenty-nine within a fortnight of convalescence; while thirty-one occurred within the following month, and thirty-one within five or six months, which appears to prove that in this fever there is, not only during the existence of the fever, and immediately after, but for six months subsequently, a liability to this, and probably other local inflammations, against which the practitioner should be on his guard. The fever, as Dr. Anderson observes, was distinguished by the tendency to congestion of the liver and spleen, and to rheumatic affections; while congestion of the kidneys, causing albuminuria and dropsy, with this inflammation of the eye and affections of joints, followed. In the treatment, Dr. Anderson relied on bleeding, mercury, and belladonna, rejecting bark, except in its proper place, as an aid. He treated a few cases without mercury, which appear to have terminated in a satisfactory way,

The history of this inflammation of the eye is well calculated to convince medical practitioners that diseases of this organ are entitled to their particular consideration, if for no other reason, because they afford so much evidence of a tendency to local inflammation in certain states of the entire system. When internal organs are affected, such as the liver, spleen, lungs, or kidneys, whether we please to call the affection congestion or inflammation, we cannot see them, and can therefore form but an imperfect judgment as to the extent of the disease: but where the eye is the seat of the mischief, so much is visible, that we can see the progress from beginning to end, and can modify our treatment accordingly.

ON SYPHILITIC INFLAMMATION OF THE EYE.

THAT inflammation of the eyeball is one of the forms of disease in which syphilis displays itself, is now generally admitted, notwithstanding the doubts of Mr. Hunter on the subject. It is generally called syphilitic *iritis*, because the inflammatory changes are more conspicuous in the iris ; but the remarkable redness of the sclerotic, the great imperfection of sight from the very commencement, and the subsequent opacities of the membrane of the aqueous humour and crystalline lens, prove that all parts of the organ are engaged, and that therefore the practitioner should have his attention directed perhaps more to the retina than to other structures. Whether it is to be looked upon as an accidental inflammation, modified by a peculiar and specific state of the constitution produced by syphilis, or as one of the distinct forms in which the venereal disease displays itself, may perhaps admit of doubt ; but that it is different from other forms of inflammation in its nature, symptoms, and consequences, can scarcely be questioned. The place it occupies in the order in which secondary symptoms appear has not been unequivocally determined, and it not very uncommonly occurs unaccompanied or preceded by any of them. Mr. Lawrence, in his work on Venereal Diseases of the Eye, says, that "although sometimes occurring alone, it is more commonly accompanied by other secondary symptoms, such as eruptions, ulceration of the throat and mouth, pains of the limbs, and swellings of the periosteum. It is seen in conjunction with papular, scaly, tubercular, and pustular eruptions. As it belongs to the earlier class of secondary

syphilitic affections, it sometimes shows itself like the other symptoms of that class before the primary disorder is cured." Mr. Carmichael, in his *Lectures on Venereal Diseases*, published in the *MEDICAL PRESS* in 1840, says, that "though this formidable affection is not confined to the papular disease, yet for one instance we meet with in practice connected with the symptoms of the other forms, we at least find twenty connected with this." Mr. Mackenzie, in his work on *Diseases of the Eye*, observes, that "the local secondary symptoms with which he has most frequently found syphilitic iritis associated have been pustular, papular, and scaly eruptions on the face and over the body, and next to these sore throat. The pustules on the face, which he has met with as attendants on syphilitic iritis have frequently been large, hard, and seated so deeply in the skin as almost to deserve the name of tubercles. The scaly eruptions on the face have occasionally presented an approach to the areolar form of lepra. Over the body, again, where the eruption has generally been of a more acute character, the appearance has been that of numerous circular elevated spots of a brownish-red colour about the size of a split pea, ending in a desquamation of successive thin pellicles of cuticle." Mr. Hewson, in his excellent treatise on "*Ophthalmia accompanying the secondary forms of Lues Venerea*," makes the following observations on this subject:—

"It is only when lues venerea has advanced to its secondary stages, and more or less contaminated the system, that the eye is susceptible of this disease; an half-cured, indolent chancre or bubo may be present with it, but some degree of constitutional taint is necessary to its production.

"Some facts have led me to believe, that where the constitutional symptoms are most distinctly and strongly marked, and are attended with most general disturbance, in the same proportion will those attending the ophthalmia be violent and

severe; and, on the other hand, where the former are few and feebly developed, so will the latter be slow and insidious in its progress, and mild in its symptoms. I have also pretty generally remarked that, in those cases in which no mercury has been used in the primary stages, or previous to the occurrence of the ophthalmia, this has appeared in its severest and most exasperated form; whereas, with those in which this remedy has to a certain extent been employed, the contrary has been observed. Thus, among the cases noted as having the ophthalmia in the former state, many have been nurses who were infected by suckling poekey children: to these the disease is generally communicated in a manner unexpected, and its nature not being known, is allowed to proceed to its secondary stages without the intervention of its proper remedy. Women, also, who have been disordered by their husbands, have been placed under similar circumstances, and similar results generally attend their cases. On the other hand, the patients with whom the ophthalmic symptoms have manifested most mildness and indolence, who are by far the majority, have been those whose previous treatment has been conducted on what is called the alterative plan—by pills, and without confinement. I must, however, acknowledge, that the worst and most unfortunate cases have been preceded by an irregular, inefficient, and protracted use of mercury.

“It would lead me out of my limits, and would be scarcely possible to examine and enter on a minute description of all the varieties and forms of constitutional symptoms, which in different cases will be found to accompany the ophthalmia, for this would embrace a history nearly of the whole venereal disease; it will, however, be necessary to take a short view of the most frequent and remarkable.

“Some species of eruption most commonly attends it, and this is usually either of the papular or scaly kind; we are not, however, to credit the statement of a recent speculative writer, who would have us believe that it is only joined with the papular. Though appearing most frequently in company with the eruptions I have mentioned, it is not necessarily connected with these or any of the eruptive symptoms, which in

such endless variety indicate a constitutional taint. It may be associated with any general symptom; or, as it is distinct from, and independent of all, so it may exist alone. When the characters of any of the eruptions, of which I have now spoken, are sufficiently distinctive of their morbid origin, this concurrence will be decisive of the nature of the ophthalmia, if any previous doubt exists respecting it; but when these are faint and obscure, other circumstances of the case should be looked into: we must examine into the present and previous state of the patient's health, the time he had received any venereal infection, the treatment that had been employed, and the occurrence or not of any succeeding symptom.

“If, in conjunction with some suspicious appearance about the skin, we observe him pale and emaciated; that his health and strength have been for some time on the decline; that he is less equal to his usual bodily exertions; that he complains of pains about his limbs and joints, particularly at night, together with nocturnal perspirations; that at some recent period, generally within the twelvemonth, he contracted venereal symptoms, in the treatment of which there appears something faulty or objectionable; we have strong grounds for concluding the case to be syphilitic.

“If the skin is free from any symptom to which we can attach suspicion, we are next to examine into the state of the throat, which is very frequently affected at the same time with the eye. We shall here often find one or more ulcers, or a greater or less degree of excoriation, or irritation, either actually present with, or immediately preceding, the ophthalmia; and in some instances the transition of the disease from the throat to the eye has been remarkably rapid, a day or two only intervening between its disappearance from one and its seizing on the other. As the symptoms about the throat are often of an extremely dubious character, we can seldom solely rest our judgment on them; but must, as has been observed above, take our view of the case from an inquiry into the other circumstances attending it.

“Besides the symptoms now enumerated, there may likewise be discovered, in different parts of the body, morbid

cicatrices, blotches, or ulcers ; or the patient may have pains and swellings in his joints, on parts of the periosteum or bones ; and, in short, any symptom, even the latest or the most remote, may be conjoined with the ophthalmia. Not a few cases, however, will offer, in which the ophthalmia is for the most part solitary ; for, like many other symptoms of lues venerea, it may exist alone, and be our only evidence of a diseased state of the system. In one remarkable case, in which the ophthalmia followed the healing of some warty tubercles about the serotum and folds of the nates, by means of local applications, it was the first and only symptom indicating this effect. And amongst women, also, we shall often find that, in addition to the ophthalmia, the only circumstance leading to a suspicion of the constitution being tainted, is their having had repeated abortions, or still-born children. Under these circumstances, a familiar acquaintance with the characteristic appearances of the ophthalmia will be particularly useful, as by this means the attention will always be directed to such inquiries as will afford the clearest insight into the nature of the case."

In my own practice, I think I may safely say that I more frequently meet with the disease unaccompanied by any eruption or sore throat than otherwise. So much so, that I can only satisfy myself respecting its nature by inquiries as to the previous occurrence of primary sores, and the present existence of nocturnal pains and perspiration, periosteal tenderness, emaciation, and general ill-health. On the changes which take place in the eye, I rely very much for the purpose of diagnosis, as I shall have to explain presently. This discrepancy as to the place iritis occupies in the order of secondary symptoms admits of explanation. Patients labouring under eruptions or sore throat, if attacked by inflammation of the eye, will go to the practitioner most celebrated for the treatment of syphilis, because he naturally suspects that his symptoms are owing to that disease ; but if attacked by iritis

alone, he will apply to the person he relies on for the treatment of disease of the eye. Hence the one sees most of his cases with eruptions or sore throat, and the other without them.

As it is desirable, if possible, to distinguish the syphilitic from other forms of inflammation of the eye, and as this often cannot be effected from the history of the case or constitutional symptoms, it becomes necessary to consider carefully, whether or not the changes which take place in the organ itself are peculiar, or different from those which occur in simple, uncomplicated, or idiopathic inflammation. In the first stage of the disease, when the changes in structure and appearance are owing to mere increase of vascularity, it is I believe impossible to pronounce an opinion as to the character of the disease from inspection of the eye; but in what I consider the second stage, the period of adhesion, effusion, and loss of transparency, I think a satisfactory diagnosis may generally be made, especially when the inflammation has been permitted to go on for some time unchecked. The opacity of the membrane of the aqueous humour takes place more frequently, and is more remarkable; the effusions of lymph or purulent matter into or upon the iris is more usual and characteristic; and the adhesions of the pupil to the lens are more rapid and extensive in formation. The opacity of the membrane of the aqueous humour is indeed almost exclusively found in syphilitic iritis. It occurs in that form of inflammation of the eye which is in a great degree confined to the chamber of the aqueous humour, and which is generally observed in delicate females of feeble frame or scrofulous constitution; but seldom, if ever, in the simple idiopathic inflammation of vigorous and healthy men. It is to this opacity I alluded on a former occasion when describing the changes which take place in the membrane of the aqueous humour in consequence of simple inflammation,

and I again noticed it more in detail when enumerating the permanent effects of inflammation. Mr. Wardrop notices it when treating of inflammation of the membrane of the aqueous humour; he says "it is indicated by one or more spots which distinctly denote an opacity of its substance. These do not resemble any of the common forms of speck, but have a mottled appearance;" and Mr. Hewson describes it in the inflammatory stage, considering it to be a clouded or opaque condition of the aqueous humour itself. He observes, "this humour is always more or less clouded by an opaque fluid which is generally seen floating in the anterior chamber. This prevents a clear view of the iris and pupil, and causes an appearance as if there was an opacity of the cornea." In this I am convinced that he was mistaken, because I believe that the aqueous humour is very seldom, if ever, rendered opaque by effusion of purulent or other matter into it; but on the contrary, when purulent matter is secreted, it does not become diffused or mixed with the natural fluid, but falls down, presenting the peculiar appearance called hypopium. That it appears very like a muddy or clouded state of the aqueous humour I admit, and this is rendered still more deceptive by the circumstance that the opacity seldom occupies the whole of the membrane of the aqueous humour lining the back of the cornea, but is confined to its lower half or two-thirds, leaving the upper part transparent, as if the opaque material had subsided towards the bottom. It is, however, to be observed, that the mottled or speckled appearance is not seen during the inflammatory stage: it is one of the effects or consequences which remain long after the inflammation has subsided. The opacity is at first a diffused, uniform, muddy or clouded patch resembling, as has been seen, effusion into the aqueous humour.

Syphilitic inflammation of the eye, although unaccom-

panied by any cutaneous eruption, sore throat, or other secondary symptom, may generally be recognized from the greater amount of disease affecting the iris. That the yellow depositions of coagulable lymph or purulent matter already described, may sometimes occur in other forms of inflammation cannot be denied, but that they occur far more frequently in the syphilitic form is equally certain. Whether we call them globules of lymph or abscesses, they are found in their most perfect and characteristic shape and appearance in this species of inflammation; so much so, that when present I hesitate not to predict at first sight that on inquiry the existence of syphilitic disease will be established. These depositions have already been described when treating of the consequences of inflammation in its simple or uncomplicated form; it only remains to add, that the dull-red or light-brown irregular ring surrounding the pupil is perhaps found almost exclusively in the syphilitic species. The greenish-yellow stain, on the other hand, is as often, if not oftener, observed in idiopathic inflammation, or after injury.

These depositions, tubercles, or globules, are described by Mr. Hewson as follows:—

“Likewise, we will have in many cases to attend to a very singular, and, I might add, characteristic symptom, to which I have already alluded—namely, the formation of one or more small tubercles on some part of the iris. When these occur, there is always more pain and tenderness felt in the eyeball than usual; they commonly present themselves at or near the pupil, and on that part of it where the morbid process is most active. Now and then they are seen on the surface of the iris, between the pupil and its ciliary attachment; they are found from the size of a large pin’s head to that of a small split pea: sometimes there appears but a solitary one, at others we see two or more of them unconnected; but in some cases a number are clustered together, and project into the

pupillary space, so as nearly to fill it up, or protrude forward into the anterior chamber: at one time they hang pendulous, at another they are attached by a broad base: when small, they are of a dark red colour; but when large and prominent, they are more or less white at the apex, while about the base the redness continues. By closely examining them in this latter state, we shall distinctly observe that the inflamed superficial membrane of the iris is reflected over them, and forms their anterior covering; and thus, when these tubercles are small, their covering retains the redness caused by its state of inflammation; but when they are larger and more pointed, it becomes transparent about the apex, where, as happens in a common pustule, their whitish contents are visible.

“While in this state, in some rare cases, the tubercle bursts, and its purulent contents are poured into the anterior chamber, thus giving rise to the symptom called hypopium, so common in idiopathic internal ophthalmia. The different circumstances, however, I may here shortly remark, under which this symptom occurs in these respective species of ophthalmia, are, with a little attention, sufficiently manifest; for, in the venereal case, we clearly observe that the matter is deposited into the anterior chamber from the pustular tubercle, which is previously formed and always present; whereas, in the latter instance, we cannot distinguish from what direct source it is produced.

“After the disappearance of these tubercles, we may often discover a fissure or cicatrix in that part of the iris where they have been situated. With regard to their nature, from what I have observed of them, I would conclude that they are either pustular or for the most part formed of a purulent deposition. Having never found them attendant on any other kind of inflammation or morbid action, I have always looked on them as characteristic of venereal ophthalmia.”

The depositions of lymph and other changes in the organization and appearance of the iris are thus noticed by Mr. Lawrence—“The change of colour which the organ

undergoes is one of the most striking characters of iritis. A light coloured iris assumes, under inflammation, a yellowish or greenish tint; occasionally, it is distinctly yellow; and, if the eye be blue, a bright green is sometimes seen. Generally, however, the tint, whether yellow or green, is of a dull and muddy cast, and darker than in the sound state. In case of the iris being naturally dark-coloured, it presents, when inflamed, a reddish tinge. Together with these changes of colour, there is a complete loss of its natural brilliancy; it becomes dull and dark, and the beautiful fibrous arrangement, which characterizes it in the healthy state, is either confused or entirely lost. These changes which are rendered particularly obvious by the contrast between the inflamed and the sound eye, commence in the pupillary margin. In an early period, the very edge of the pupil alone may be affected; the internal circle then becomes altered in colour, and thickened; and afterwards the change spreads gradually to the external or ciliary edge of the iris. This alteration of colour is produced by effusion into the texture of the organ; and the particular tint is such as would arise from blending with the natural colour of the iris that of the lymph, which is yellowish or brownish. The deposition of lymph takes place under various modifications in syphilitic iritis; 1st, its effusion into the texture of the iris generally causes the changes of colour just described. 2ndly, it may be deposited in a thin layer, covering a larger or smaller surface. In this way, the edge of the pupil first, and subsequently the lesser circle of the iris assume a reddish brown or rusty colour in the beginning of the affection. The discoloured part has a rough villous appearance, when closely inspected, and we shall generally find, on careful examination, more particularly on looking at the part sideways, that slight elevation and irregularity of surface are produced by this new deposit. Sometimes

the stratum of lymph has a light yellowish brown or ochrey tint, and a loose villous texture, rising into obviously prominent masses. The rusty colour is the most common, and is observed particularly in blue irides; the other is seen in the gray, or the mixture of gray and orange. This kind of deposit is generally confined to the inner circle of the iris; but the outer circle is usually, at the same time, more or less discoloured and dull. 3rdly, the lymph may be effused in distinct masses—that is, in small drops or tubercles of a yellowish or reddish brown colour; sometimes they are of a bright red, and sometimes yellowish. They vary in size from that of a pin's head to a split pea. Often there is only one; there may be two, three, or more. They may be deposited on the edge of the pupil, or in any part of the anterior surface of the iris. When the inflammation is very active, and has been neglected or improperly treated, the lymph is sometimes secreted so abundantly as nearly to fill the anterior chamber; in which case it has a light dirty yellowish tint, and often a looseness of texture, with semi-transparency. 4thly, under violent inflammatory action blood itself is sometimes effused, and is mixed, in a coagulated state, with the tubercular masses of lymph. I have seen such effusion of blood where the inflammation has not been of the most violent kind. 5thly, lymph may be poured out from the margin of the pupil or the uvea, so as to agglutinate them partially or generally to the capsule of the crystalline. A mass of lymph sometimes fills the pupil. More commonly, a thin grayish web or film stretches across the opening, which loses its clear black colour, and has a cloudy appearance. Lymph may be effused in considerable quantity into the posterior chamber, and either make its way through the pupil into the anterior chamber, cause a bulging of the sclerotica, or penetrate that membrane, and form a tumour under the conjunctiva."

I have already said that the yellow or bright green tint above alluded to by Mr. Lawrence is as often observed in idiopathic inflammation or after injury as it is in syphilitic iritis: it cannot therefore be considered a characteristic symptom. The effusion of blood which he notices also takes place in other forms of inflammation of the iris, and perhaps more frequently than in this. It is a very remarkable consequence of inflammatory action, and should have been noticed when I was describing the symptoms of acute inflammation of the eyeball, and the changes in the structure of the iris from progressive inflammation. It occurs, however, but rarely, and I think oftener in eyes that have previously suffered from inflammatory action, and in aged or debilitated persons. The effused fluid is obviously blood, for it stains or tinges the aqueous humour, and subsequently forms a coagulum in the lower part of the anterior chamber, or falls down in the same shape as a purulent hypopyum, and is ultimately absorbed. The greater depositions above alluded to, as making way through the pupil into the anterior chamber, causing a bulging of the sclerotic, and forming a tumour under the conjunctiva, do not take place in syphilitic inflammation exclusively, but are rather a consequence of scrofulous disease, as I shall have to notice hereafter.

All the consequences already enumerated as following simple inflammation of the eye are also observed in syphilitic inflammation. There are the irregularities, contractions, and adhesions of the pupil, the loss of contractile power in the iris, and in neglected or mismanaged cases, cataract both capsular and lenticular, with disorganization of the retina and consequent amaurosis. In the worst cases the shape of the eyeball is altered: the sclerotic yields or bulges irregularly, or the cornea is projected forward, as in a bird's eye. In other cases the whole globe shrinks or contracts, the cornea is diminished in size, and the eyelids

fall into an unfilled orbit. Beer considered that a peculiar irregularity of the pupil, in which it is drawn or displaced in a direction upward and inward, was characteristic of syphilitic iritis. I cannot say that I have observed this frequently in any form of iritis, and I do not think that I have seen it oftener in the syphilitic form. Mr. Lawrence says it is displaced in this direction "sometimes but not constantly;" and Dr. Mackenzie says that he has seen it "in chronic rheumatic iritis, and still more frequently in choroiditis, unattended by iritis;" and adds, that "he cannot then regard it as diagnostic of syphilitic iritis."

TREATMENT OF SYPHILITIC IRITIS.

IN the treatment of syphilitic inflammation of the eye it appears to be admitted on all hands that, whatever confidence we repose in other remedies as auxiliaries, our principal reliance is on mercury. Not only is it relied on for the cure of the specific disease, of which the iritis is a symptom or part, but, as in simple uncomplicated inflammation of the eye, for the reduction of inflammatory action and prevention of its consequences. Whatever difference of opinion may be entertained respecting the necessity of resorting to mercury in other forms of syphilis, the effects of the disease on the delicate structures of the eye are too serious to permit of any hesitation or temporizing. It also appears to be admitted that it is in this species of iritis mercury displays its power most conspicuously. There is not in fact to be found in the whole range of surgical practice a more remarkable example of the remedial influence of a medicinal agent on disease than that observed in the treatment of syphilitic iritis by mercury. In a few days it, and it alone, will in a recent case, and in

constitution otherwise healthy, arrest an active inflammation, which otherwise will, most probably, proceed unchecked to the destruction of the organ. I have already when describing the treatment of inflammation of the eye, fully considered the use of mercury, the form and quantity in which it should be administered, and the length of time during which it should be continued. It is therefore unnecessary to repeat these observations, neither is it necessary here to consider how far the practitioner should avail himself of the opportunity afforded him in thus treating one form of secondary syphilitic disease to persevere with the remedy for the total eradication of the malady from the system.

I have reserved the consideration of turpentine as a remedy in the treatment of inflammation of the eye until the present stage of the inquiry, because it has been more particularly recommended in syphilitic iritis; yet it is perhaps in this very form that it is least likely to be fairly tested, the practitioner having a double inducement to prefer mercury, from its known efficacy in venereal diseases, as well as from its effects in simple inflammation. It is also on account of the acknowledged value of mercury that turpentine, although recommended fifteen years ago, has not yet had a fair trial. The practitioner, in simple, recent, uncomplicated cases, naturally prefers the medicine he has known to succeed under similar circumstances, and only resorts to the other where he finds that the former does not succeed, or that for some particular reason he cannot employ it. Influenced myself by such considerations, I cannot say that I have fairly tested turpentine as a remedy in the treatment of inflammation of the eye, except as an auxiliary or resource in the failure or unfitness of mercury, to which extent I can bear testimony to its value. This being the case, I consider it best to quote the arguments and statements in its favour offered

by Mr. Hugh Carmichael of this city, who first called attention to it in an essay on the subject published in 1829.

“The attention of the profession has been in so many instances directed to the administration of turpentine in peritoneal inflammation, that the claims of that medicine to our notice, as a valuable remedy in this complaint, may at present be considered fully established. The number of cases recorded in the different periodical journals which have yielded to its exhibition, render it unnecessary here to make any further remark on the subject.

“If we observe the nature of the parts which are the seat of peritonitis, the description of inflammation that engages them, and the subsequent morbid appearances, and compare all these circumstances with those to be met with in iritis, strong grounds will, I think, appear for presuming that in many points a striking similarity may be traced between them; in both a serous membrane is engaged, and in both the adhesive inflammation is to be seen producing adhesions between surfaces intended by nature to be free. It is true that the two diseases occur in parts of the body very different from each other in many respects; and it is likewise true that this material difference is supposed to exist between them—namely, that while peritonitis is a simple idiopathic disease, iritis on the contrary, in its different varieties, but particularly in that which follows syphilis, is thought to proceed from a peculiar constitutional taint, and consequently to participate in its peculiar nature: but even admitting this difference, their characters nevertheless unquestionably coincide in these essential points, that in each the adhesive inflammation, and its consequences, are the morbid appearances to be observed.

“Under this impression I was induced to make trial of turpentine in iritis, conceiving that where such similarity of appearances were met with, as those just mentioned, a medicine possessing any control over them in the one situation, might probably be productive of some benefit in the other: a

few cases were, therefore, submitted to its influence, and the results were such as to confirm the idea I had formed: the first trial was in 1824.

“I use the turpentine in this complaint in drachm doses, given three times a day. Its disagreeable flavour and nauseating effects I have found best obviated by almond emulsion. This circumstance it is very necessary to attend to, the medicine being so unpleasant, that, if its taste be not in some way disguised, it is difficult to depend on patients taking it with the necessary regularity. In the formation of the emulsion if double the quantity of confection directed in the London pharmacopœia be employed—that is, two ounces to the half-pint of water, it answers the above objects much better: the residuum may be removed by straining.

“With an emulsion so made, the following is the formula I now generally adopt:

℞ Olei terebinth. rectificat. ℥i.
 Vitelli unius ovi tere simul et adde gradatim.
 Emulsionis amygdalarum, ℥iiij.
 Syrupi corticis aurantii, ℥ij.
 Spiritus lavandulæ compositæ, ℥iiij.
 Olei cinnamomi guttas tres vel quatuor.

Misce, sumat cochlearia larga duo ter de die.

“In a few cases it has been necessary to increase the quantity of turpentine to an ounce and a half, or two ounces, in the above mixture, the other ingredients being proportionally diminished, so that a drachm and a half, or two drachms of it may be taken each time; but in general, when administered to the extent directed in this formula, it has very seldom indeed failed, though extensively tried, and in very urgent cases: the instances of its failure shall be presently noticed.

“The strangury, so frequently induced by the internal use of turpentine, is obviated by the usual means—flaxseed tea and camphor julep: when very urgent, the medicine may be suspended for a time. The tendency to acidity in the stomach, which it sometimes causes, is relieved by the addition

of carbonate of soda to the mixture ; ten or fifteen grains to the eight ounces will be sufficient ; some patients have said, the taste was further disguised by this addition.

“ When the local inflammation is high, and acute pain is present in the eye and side of the head, the abstraction of blood from the temple, by cupping, or the more immediate seat of the disease, by leeching, may be resorted to : the same practice is adopted where mercury is used. Nevertheless I have frequently, when these symptoms were very urgent, relied solely on the turpentine mixture, and with the most decided and expeditious relief ; indeed in some instances, where the pain and hemicranium existed as acutely as they are perhaps at any time to be met with, patients have declared they were considerably relieved after they had taken it once or twice, and that its subsequent exacerbations were lessened in a very remarkable degree. It is in the former cases I have generally found it necessary to follow up the bleeding by increasing the quantity of the turpentine.

“ It is highly necessary to observe, that the condition of the bowels will require attention ; the beneficial effects of the medicine appear to be in certain cases suspended when constipation is present, and are called forth, as it were, when this is removed.

“ Perfect rest, if not absolutely material, will at least be found most conducive to the complete production of its salutary effects. In a few cases where patients, from their particular situations in life, were obliged to continue in active employment, the same satisfactory results did not follow its exhibition, nor was its influence fully established until this was attended to.

“ When all the other symptoms of the disease have subsided, except a slight remaining indistinctness of vision, I do not consider it necessary to continue the medicine farther : some time is generally necessary for the complete removal of this ; but the powers of the system may be relied on for its accomplishment. Wherever I had an opportunity of examining patients who had been dismissed with this indis-

timetness of vision, I have always found them to have been quite relieved from it a short time after they were so discharged.

“In some of the following cases, particularly the first of them, it will be seen that sedatives were employed along with turpentine, such as opium, henbane, and cicuta; but it is almost needless to add, that they could not have any share in the cures which took place in these cases. The same description of medicine—namely, opium, is also used, and pretty extensively, when mercury (calomel) is the treatment adopted; but the removal of the disease under it is entirely attributed to the latter, the former being conjoined with it for the purpose of detaining it in the alimentary canal, and thereby promoting its absorption into the system; or it may also have the effect of allaying severe pain, and with which view they were exhibited in the cases they were here employed in; in this way they may sometimes be serviceable.

“By these means the administration of turpentine has very seldom indeed failed in effecting a perfect cure, the amendment being generally quite perceptible the day after it had been commenced with, as may be readily conceived, from the well known quickness with which it pervades the system: I must, however, observe that, in a very few instances it was not attended with such marked success; and, although in my own opinion, its failure in them may be attributed to other causes than its inefficacy, I consider it right, however, to notice them here.

“In the syphilitic, as already remarked, its effects appear to be most decided; I mean when accompanied by those symptoms already mentioned, and which are considered as characterizing that species of iritis, relying very much on it in those attended with low and partial inflammation of the sclerotic coat.

“On the other hand, in a few cases where this inflammation was very acute, of a florid red colour, deeply and extensively engaging that membrane, the conjunctiva also inflamed, so as to form a network of vessels, obscuring

more or less the former tunie from view, and instead of forming the zone, already mentioned, at a short distance from the cornea, encroaching thereon, I did not succeed in completely removing the complaint by its administration, though it certainly arrested its progress.

“Again, in that description which occurs after fever, it sometimes was not satisfactory in its results. However, in making this statement, I must remark, that in many cases attended by the above appearances, it has effected a perfect and decided cure, and in several of those following fever, when mereury and all other means were unsuccessful, its removal was ultimately accomplished by the use of turpentine alone.

“But in speaking of those few unsuccessful cases, I have to observe on the difficulty so frequently experienced in dispensary practice, where I principally made my observations on this subject, in having our directions attended to with that strictness which may enable us to form correct opinions on the effect of any medicine. I have witnessed this negligence even in hospital practice, and had some doubts of the result for a time, till close attention discovered the medicine was not regularly taken by the patient, and on enforcing its administration in the mode I directed, the usual beneficial consequences followed; I am therefore led to imagine in those cases where turpentine did not succeed, that its failure is to be attributed to neglect on the part of the patient, rather than want of efficacy in the medicine; for without this explanation how can we account for the very same description of cases being attended in others with decided and complete success. If, however, the fact be, that some cases are not quite amenable to its influence, I am at present unable to make a distinction further than I have stated: perhaps future trials may enable me to be more explicit. Can idiosyncrasy be the cause, rendering the turpentine in these particular cases less efficacious than what it generally is?

“However this may be, in introducing to the profession a description of treatment which is novel in the disease, I think

it necessary not only to give a full account of the manner I have conducted it, but likewise the true results derived from it, according to my experience; and I have therefore stated, that in some few cases (and these very few) the administration of turpentine was not attended with the decided success I generally found it to obtain in others, and have also described the appearances which presented themselves in the unsuccessful cases.

“The great error generally committed by persons bringing forward any new mode of treatment, or medicine, is a too sanguine description of its supposed powers, the representation of which is sometimes found not to be supported by experience. The consequence of this is, that, if upon trial it does not uphold the exact character for which it has been attempted to be established, it not only falls into disrepute, but may not even be allowed the credit it fairly possesses, whereas, had correct statements been made of its defects as well as of its merits, future investigation would ascertain how far it could be trusted, and thus remedies, though not general in their application, might, with much advantage and benefit, be retained as adjuvants in the cure of certain diseases.

“Although, therefore, I have found the administration of turpentine in cases of iritis generally, to have been attended with very extensive success, and far beyond what would entitle it to rank as an assistant in its cure, still, as in some cases which were submitted to it, the same satisfactory results did not follow, I think it but right to mention it here in the manner I have done.”

In addition to, or in combination with mercury, the remedies and treatment already alluded to as resources in cases of simple uncomplicated inflammation of the eye must be employed in syphilitic iritis, or in certain cases must be substituted for mercury. Iritis will, it is well known, sometimes make its appearance while the system is under the influence of mercury administered for the cure of

secondary symptoms of venereal, or it will become stationary and untractable while the mouth is still sore from mercury given for its cure. In such case the treatment to be adopted becomes a question of importance and often of difficulty. To bloodletting, local or general, and other means of depletion, we are frequently unable to resort, because they have either already been employed, or they are inadmissible in consequence of the debilitated state of the patient. We are therefore called upon to adopt some other plan or remedy, and to select from those usually employed in other complicated forms of inflammation that best suited to the particular circumstances of the patient. Mr. Hugh Carmichael points out such cases as examples of disease likely to be benefited by the spirit of turpentine, and it is obvious, that as it affords a fair prospect of advantage, it should have a fair trial; guarding, as far as possible, against nausea or strangury. Should this fail, or should it be ineligible, the iodide of potassium may be resorted to, either alone or in combination with bark or sarsaparilla. Mr. Carmichael, in his lectures on Venereal Diseases, published in the MEDICAL PRESS, bears the following testimony to the value of iodine in the treatment of the secondary forms of syphilis:—“For the cure of the different constitutional symptoms of this form of venereal, there is no remedy so much to be relied on, in conjunction with sarsaparilla, as iodine; which latter medicine, and its combinations, I consider as a remedy of the utmost value in the treatment of this as well as of the phagedenic form of venereal disease, which includes the most formidable and hitherto most unmanageable cases met with in practice. I began to use it very soon, in cases of venereal nodes, after Dr. Coindet of Geneva, had made known its utility for goitre; on the principle, that a medicine, capable of inducing the dispersion of a tumour so obstinate, might be equally efficacious in removing

affections, however different, of a similar obstinacy in the bones, in cases where I had reason, from the accompanying symptoms, to dread the injurious effects of mercury; I therefore exhibited iodine or hydriodate of potash in this hospital many years since for secondary symptoms of these forms of venereal disease, with the most flattering success, long before there were any published accounts of its utility in venereal complaints. At present I believe it is used extensively, but without much discrimination or selection of symptoms. I began with giving iodine to the extent of a grain, with six or eight grains of the hydriodate, dissolved in a pint of distilled water, directing the patient to take a third of this quantity morning, noon, and night. At present the hydriodate of potash is usually preferred, and given to the extent of from fifteen to thirty grains, with a pint of decoction of sarsaparilla, during the day. I am not certain that the one mode has any advantage over the other; but in both ways as a remedy, iodine has exceeded in the two forms of disease alluded to my most sanguine expectations."

This evidence in favour of iodine in the treatment of secondary symptoms of venereal in general would justify our employing it in syphilitic inflammation of the eye even if experience had not proved its beneficial operation. Mr. Lawrence also bears testimony to its value. "In some cases (he observes) where mercury has disagreed, or where after a fair trial the affection of the eye has either not improved or got worse, I have lately employed with excellent effect the iodide of potassium, giving three or four grains in two or three ounces of the compound decoction of sarsaparilla three times a day. The beneficial operation of the change seems analogous to what we observe from the same succession of remedies in certain cases of venereal disease." I have myself used iodine freely and extensively in inflammations of the eye, and have frequently

employed it in cases of syphilitic iritis in which mercury was not eligible. Although it cannot be relied on as a means of arresting inflammation or as an antidote to venereal disease, equal in power to mercury, it may I believe be looked upon as possessed of these powers in a less degree: at least I can say that lingering inflammation appears to give way under its use more certainly and rapidly than when it is not employed; and I can positively state that I have treated formidable relapsing inflammations of the eye of serofulous character, but originally syphilitic, with it successfully. It must not, however, be forgotten that inflammations of the eye, like all other inflammations, sooner or later subside, be the treatment what it may, or even without any treatment; and that syphilitic inflammation runs its course, and finally disappears also; too much importance should not therefore be attached to this or any other remedy, lest by relying on it exclusively, we neglect others. We have always to bear in mind that in treating inflammation of the eye we should, after failing to subdue the vascular action at the commencement, direct our attention to the prevention of those disorganizing processes of this condition of parts; and keeping this in view, I think that both from theory and experience iodine is entitled to confidence. I have generally given the iodide of potassium in the cases alluded to either alone or in decoction of sarsaparilla or bark, as the syphilitic symptoms or debility of the system may require the one in preference to the other; and I have given it to the extent of ten grains three times a day. I have also given the combination of iodine and iodide of potassium, as suggested by Mr. Carmichael, and I do not think that I can with safety state that the latter was less effectual than the former.

If turpentine or iodine be found ineffectual or inapplicable in the treatment of syphilitic inflammation of the

eye not admitting of relief by mercury, the practitioner has to consider what other remedial resources are within his reach. He has indeed in some cases of inflammation of the eye, modified perhaps by the constitutional influence of syphilis, scrofula, rheumatism, and mercury, to encounter often the greatest difficulties which practice presents. Bleeding, local or even general, may, in certain cases, be still available, and may be followed by antimonial medicines and other antiphlogistic treatment ; but this does not often happen, the state of the constitution more frequently requiring nutritious food and preparations of bark or other tonics. Sarsaparilla, colehicum, and guaicum, afford the best prospect of advantage where rheumatic constitutional disease exists, and the iodide of potassium in decoction of bark, with some tincture of the same, promises best in scrofulous habits. In these cases where we may say mercury has gone astray, the disease remaining stationary, and the general health impaired, I generally discontinue all medical treatment for a time, and make such change as to diet, ventilation, and temperature, as can with safety be adopted. Practitioners are sometimes too anxious to push powerful remedies to the utmost without delay, apprehensive that the inflammation is causing rapid disorganization, but there is often no necessity for this hurry. The inflammation, we may say, at this period has spent its force and assumed a chronic form, requiring more a steady and continued plan of well considered treatment than any sudden change of a very decided nature. *Festina lente* is frequently the maxim to be inculcated, and in accordance with it, I generally find myself acting. In private practice, when I am permitted to have my own way, I am in the habit of commencing by getting rid of all those incumbrances which accumulate in a sick room, and making such arrangements as will secure the admission of light and

fresh air: an object often difficult of accomplishment; such places being generally more like the crowded store-rooms of furniture dealers than apartments provided for human beings. All medicine is then discontinued for a time, and nutritious digestible food substituted for slops and compositions offensive to the stomach and pernicious to the system. The patient, if in bed, is quietly dressed and placed in his chair, and if circumstances admit of it, in a day or two is removed to a sitting room, and every arrangement made to restore him to the comforts of which as an invalid he was deprived. This being done, the remedies above enumerated may be again resorted to, and the most appropriate either resumed or administered for the first time. To those who rely on the abstraction of blood from the system and suspension of the process of nutrition by denial of food in the treatment of inflammation during its entire progress, refraining from the use of the lancet and application of leeches, will obtain little favour; nevertheless it is an undoubted fact that inflammation is often rendered less destructive by preserving the natural powers of growth and reparation unimpaired. I may not go the length of Mr. Hewson, when he says, "The patient may be saved the inconveniences of blood-letting or blistering, as they do not afford the smallest benefit, nor will they allay a single distressing symptom; and the same may be said of purgatives; in which respects the venereal ophthalmia is singular, and differs from all other analogous affections," but I feel much inclined to give a qualified assent to this opinion of a trustworthy and practical man. Over and over again I have treated relapsing cases of inflammation of the eye successfully without abstracting a drop of blood, which in former attacks had been treated by profuse bleeding; and I am often obliged to administer mercury while I allow the patient his usual supply of animal food, and have even to accompany it by

bark or quinine. Amongst the species or modifications of inflammations of the eye, an *iritis* from the use of mercury has been enumerated. There does not, however, appear to be any substantial grounds for the distinction. That inflammation of the eye occurs after, or even during, the administration of mercury, cannot be denied, but that it is a consequence of it remains to be proved. There is nothing whatever in the appearance, progress, or result of inflammation of the eye following the use of mercury to justify us in assuming that it is of peculiar character; neither does the treatment require particular adaptation to any peculiar condition of the parts.

Syphilitic inflammation of the eye is sometimes, although rarely, met with in infants, and it may be assumed that its rare occurrence is to be attributed to the comparative infrequency of syphilitic disease at this time of life. The practitioner should therefore bear in mind the possibility of the existence of such disease when called upon to attend to infants suffering from disease of the eye, or of its future appearance in those labouring under symptoms of syphilis. without any present appearance of *iritis*. This it is necessary to inculcate, because syphilitic inflammation of the eye sometimes takes place in infants, as in adults, unaccompanied by any other form of the disease; and is sometimes accompanied by such slight increase of vascularity or other appearance of disease that it may escape notice. In the early stages, redness of the sclerotic, discolouration of the iris, and irregularity of the pupil, are the appearances to be observed; and at a more advanced period, alteration in shape of the sclerotic and cornea, contraction of the pupil, and adhesion of its margin to an opaque lens. Sometimes a dilated and irregular pupil with a transparent lens is the consequence; but in other cases, when the disease has escaped observation, or has been neglected or mismanaged. insensibility of the retina or amaurosis and consequent

blindness remain. At this time of life little information as to the extent of the disease can be obtained from trial of the visual power of the organ. The baby will grasp at a watch or other bright object presented to it as long as any degree of sight remains, but slighter defects of vision can scarcely be detected. It is therefore necessary to make a very careful examination of the eye, and close inquiry as to the presence of other syphilitic disease, or of its previous existence. I see these cases oftener after the mischief has been done and the organ destroyed than during the commencement of the attack when it might be saved; yet even at this period, the emaciation or defect of nutrition, arrested growth, and pallid dingy skin, proclaims the nature of the disease; and sometimes other forms of it, even now, may be detected. I was lately called on to see one of these cases, considered to be simple cataract, in a child of three years old. The pupil was contracted and adherent to an opaque lens and capsule, and vision was irreparably destroyed. This occurred when the child was only a few months old, yet on examination I found the tongue studded with small irritable ulcers and elevations, and a soft condylomatous elevation at the anus, which speedily disappeared after the administration of some hydrargyrum cum creta. The treatment of syphilitic inflammation of the eye in infants does not differ from that prescribed for adults, except in degree. Mercury and the local application of extract of atropa belladonna during the existence of the inflammation, and tonics, alteratives, and generous diet, should the disease linger, constitute the principal resources. Of the preparations of mercury the hydrargyrum cum creta appears the most appropriate and convenient, and in acute cases it may with advantage be combined at first with James's powder or other manageable antimonial. Sarsaparilla, iodine, and bark, can be resorted to as auxiliaries if necessary.

ON INFLAMMATION OF THE EYEBALL FROM GONORRHŒA.

THE inflammation of the eye to which I have here to allude, it is scarcely necessary to say, is altogether different from the violent and destructive inflammation of the conjunctiva which sometimes accompanies gonorrhœa, or is caused by the contact of gonorrhœal matter. It is an inflammation involving the sclerotic, cornea, membrane of the aqueous humour, and iris; and if neglected, mismanaged, or uncontrolled by treatment, extending to the lens and retina, and causing destruction of the organ and loss of sight. It is evidently not a common form of disease, and if the truth was known, perhaps it might be said that it is a rare disease. At least I have found it so; but following gonorrhœa, as it does, and accompanied as it generally is by inflammation of the joints, it perhaps falls more to the lot of the general practitioner than to those who attend more particularly to diseases of the eye. The information extant respecting it is not the most perfect or satisfactory, and doubts may be entertained respecting some of the views promulgated as to its origin, nature, and symptoms. From what I have seen of it, I should say that it is more an active inflammation of the cornea, an acute *corneitis*, than an inflammation entitled to the denomination of *iritis*, although it certainly does, when not arrested, extend rapidly to the iris and other parts of the eye. Like the rheumatic and other inflammations caused or modified by constitutional disease, it is liable to relapse, or will return on exposure to cold or wet, or on the recurrence of the disturbance of general health which originally preceded or accompanied it. The symptoms are, as I have said, more

those of *corneitis* than *iritis*. There is the sclerotic vascularity, but not the brilliant red of inflammation of the iris; it is a bluish red as if veins, more than arteries, constituted the vascular turgescence; and it does not present so conspicuously the radiating arrangement of vessels and pink zone described as characteristic of the common inflammation of the eye called *iritis*. In fact, it presents more the character of the vascularity which accompanies the unequivocal inflammation of the cornea, to which I shall have to direct attention hereafter, than to the vascularity which accompanies any form of inflammation of the iris, or even of the cornea when inflamed from injury or irritable ulcer. The cornea becomes milky or clouded, not merely at the margin, as often happens in *iritis*, but throughout its entire breadth; and its surface presents that rough appearance which may be considered characteristic of inflammation of this structure. This is remarkable, and proves that the cornea is particularly the seat of the disease, because in *iritis*, whether idiopathic or syphilitic, all the structures composing the cornea remain perfectly transparent except the membrane of the aqueous humour lining its internal surface, which, as I formerly stated, sometimes acquires a peculiar characteristic speckled or dotted opacity. I have not, however, observed that the cornea in these cases becomes pervaded by red vessels, as in common chronic *corneitis*, neither have I seen it become the seat of abscess or break into ulceration. That the membrane lining the chambers of the aqueous humour is engaged in the inflammation I believe, because the speckled or dotted opacity visible in *corneitis* may be sometimes observed, and because adhesions of the pupil are found after the inflammation subsides which cannot take place without inflammation of this membrane. Mr. Maekenzie says that coagulable lymph is effused into the pupil and anterior chamber: this I have not seen, but its

appearance also proves the inflammation of this membrane, as it is from it in all probability effusion takes place. The state of the iris cannot be accurately ascertained on account of the opacity of the cornea, but that it is inflamed is to be inferred from the fixed, and perhaps in some cases, the contracted state of the pupil, and from its loss of power of dilatation under the application of belladonna. The adhesions of the margin of the pupil to the capsule of the lens, found after the inflammation subsides, afford evidence also of the inflammation of the iris, although they may be attributed to inflammation of the membrane lining the chambers of the aqueous humour. It is also difficult to determine the real state of the retina in consequence of the opacity of the cornea, and the fixed, adherent, or contracted state of the pupil interrupting the transmission of light, and so impairing vision; but I think sight is not so much diminished as in common iritis, and after recovery it is not perhaps so often permanently impaired. There is much more pain, intolerance of light, and occasional flow of tears, than in idiopathic or syphilitic iritis. Mr. Lawrence, who has paid particular attention to this disease, thus describes it in his work on Venereal Diseases of the Eye:—"The vascular trunks lying between the conjunctiva and sclerotica are distended, and the anterior portion of the latter membrane becomes of a pink or purplish red. As the conjunctiva participates but slightly in the affection, these changes are distinctly seen through it. There is increased lachrymal secretion, severe pain in the eye with sense of tension, intolerance of light with profuse discharge of tears on the slightest exposure. The pain and intolerance are sometimes excessive, so that the smallest access of light cannot be borne. The inflammation soon extends to the iris, which loses its brilliancy, assuming a dull and deeper hue. The pupil contracts, and lymph is effused from its margin. The external redness

is increased, the vessels of the conjunctiva being more distended. The cornea at the same time becomes hazy, and vision is more or less impaired. Nebulous opacity and speck of the cornea are sometimes produced. As the inflammation subsides, the iris recovers its natural colour, and vision is restored. If the inflammation be considerable, it may cause adhesions of the pupil, with contraction of the aperture ; and the adhesions thus formed are sometimes white as in arthritic iritis. Even permanent dimness of sight may be produced. Sometimes repeated attacks of the disease occur, each of which causes fresh adhesion, so that at last the pupils are fixed in their whole circumference and considerably contracted. This is exemplified in one of the cases which also shows that the complaint is not always very serious, as the patient had escaped without any material imperfection of sight, although he had employed nothing but a wash in the several inflammations he had experienced."

Dr. Mackenzie, in his treatise on Diseases of the Eye, thus describes the symptoms:—"In general the inflammation of the eye is very severe. It often commences with redness of the conjunctiva and sclerotic, and a striking haziness of the lining membrane of the cornea. The inflammation speedily affects the anterior surface of the iris which loses its natural colour. The disease for some days appears to be an *aquo-capsulitis*. It then merges into an *iritis serosa*. The pupil becomes contracted and the vision dim. A profuse effusion of coagulable lymph now takes place, speedily filling the pupil, and sometimes falling in considerable masses into the anterior chamber. The anterior chamber is sometimes almost filled with the effused lymph. In fact, no other variety of iritis presents this symptom in the same degree. There is violent pain in and round the eye, with epiphora and intolerance of light. I have seen considerable chemosis or conjunctival edema

attend gonorrhœal iritis; but there is no purulent discharge from the conjunctiva. There are no tubercles or abscesses on the surface of the iris, as in syphilitic iritis." I have already said that I have not seen the profuse effusion of coagulable lymph here noticed by Dr. Mackenzie; and although Mr. Lawrence says, "the pupil contracts, and lymph is effused from its margin," I find but one allusion to such a change in his recorded cases. I therefore come to the conclusion that this disease, although in its nature of uniform character, presents considerable variety in its degree and symptoms.

That this disease arises as a consequence of gonorrhœa, in common with inflammation of the joints, is an interesting and instructive pathological fact, which cannot, I believe, be doubted. A mild form of conjunctival inflammation, very different from the violent gonorrhœal ophthalmia, appears to be a consequence of it also. So much so that they might almost be looked upon as secondary symptoms of this form of syphilitic disease. At the same time it must be admitted that it sometimes takes place unaccompanied or preceded by true syphilitic gonorrhœa, and only in common with inflammation of the joints and urethra in consequence of gout or rheumatism. Purulent discharge from the urethra, with scalding pain in making water, and chordee, takes place; and this inflammation of the eye with inflammation of the joints occurs simultaneously or consecutively, but it is sometimes difficult to determine whether all these are but symptoms or consequences of the one general or constitutional disease, or whether the inflammation of the joints and eye are consequences of the disease of the urethra. Mr. Lawrence seems to be of opinion that the gonorrhœa and inflammation of the eyes and joints have a common origin in a rheumatic constitution, and that when the iritis follows true gonorrhœa it does so in consequence of that disease oper-

ating as an exciting cause. "As the train of diseases just described (he observes) must be referred principally to peculiarity of constitution, gonorrhœal infection is not essential to their production; it is only to be regarded as one of the exciting causes, and perhaps the most frequent. There could be no doubt that gonorrhœa had been contracted in several cases of which I investigated the history; while in another instance the patient was convinced that he had not received infection." In every case of this disease which has come under my observation the gonorrhœa to which it was attributed was accounted for in the usual way, and bore all the appearances of that disease as it is generally met with. Sir Benjamin Brodie, in his treatise on Diseases of the Joints, records four or five cases in which inflammation of the eye or conjunctiva accompanied or followed inflammation of the urethra with purulent discharge, and inflammation of the joints. In the first, "a gentleman, aged 45, became affected with symptoms resembling those of gonorrhœa. There was purulent discharge from the urethra with ardor urinæ and chordee." This occurred in the middle of June, and on the 23rd, about a week after, he first experienced some degree of pain in his feet, which rather increased the next day, but not so much as to prevent his walking four miles. There was now also some appearance of inflammation of his eyes, and on the next day the conjunctiva of both was much inflamed, with a profuse discharge of pus. "These symptoms (he states) increased in violence, the pulse varying from 80 to 90 in a minute, the tongue being furred, and the patient being restless and uncomfortable during the night. The whole of each foot became swollen; there was inflammation of the synovial membrane of the ankles, and it appeared to me that the affection of the feet themselves arose from inflammation of the synovial membranes belonging to the joints of the tarsus, metatarsus,

and toes. He said that he could compare the pain which he experienced to nothing else than that which might be supposed to arise from the feet being squeezed in a vice." In two days more the left knee became painful, and exceedingly distended with synovia, but the inflammation of the urethra and eyes somewhat abated, and on the 30th, a week after the commencement of the pain in the foot, and the inflammation of the conjunctiva, and a fortnight after the first appearance of the discharge from the urethra, the inflammation of both the urethra, eyes, and joints, had much subsided. From this to the first of August, a period of six weeks from the commencement of the discharge from the urethra, he continued to mend, although there was pain of the other knee, and of the elbow and shoulder, and gradually recovered, until December, when he had another attack of the same kind, which lasted six weeks, and left him again considerably crippled. In the following March "he became affected with an ophthalmia, but of a different nature from that which he laboured under in the preceding summer. The inflammation was seated in the *proper tunics* of the eye, and it appeared probable that it would speedily have terminated in adhesions of the iris, and destruction of the powers of vision, if its progress had not been arrested by repeated bloodlettings and the use of mercury. He had another attack of ophthalmia of the same kind four years afterwards." Sir Benjamin Brodie says he has had an opportunity of seeing many other cases in which a similar train of symptoms took place, and amongst them one of a gentleman who had suffered from as many as nine attacks; the first when under twenty years of age. In one of them "the first symptom was inflammation of the urethra with purulent discharge, although from particular circumstances he could not believe that he had been exposed to the risk of infection." This was followed by purulent

ophthalmia and inflammation of the synovial membranes, while in three other attacks purulent ophthalmia was the first symptom, and was followed by inflammation and discharge from the urethra, and inflammation of the synovial membranes. In four other attacks the synovial membranes were inflamed without any inflammation of the eye or urethra, and in two others the patient was seized with a very violent inflammation of the sclerotic coat and iris, first of one eye and then of the other. These cases are highly instructive, proving, as they do, that inflammation of the urethra, joints, conjunctiva, and eyeballs, takes place in certain constitutions simultaneously or consecutively; and teaching us that the otherwise unexpected occurrence of iritis after gonorrhœa is not so anomalous or difficult of explanation as might otherwise appear. Sir Benjamin Brodie observes that the circumstance has not been noticed by any pathological or surgical writer, and as far as I can learn it is so, although perhaps cases may be found in which such symptoms coexisted. Mr. Lawrence has since, in his treatise on Venereal Diseases of the Eye, recorded several cases of inflammation of the urethra, conjunctiva, eyeball, and joints, occurring together in the same person, the majority to be traced to true gonorrhœa, but some taking place without exposure to the contagion of that disease. Upon the whole, it may, I think, with safety be admitted, that in certain gouty or rheumatic constitutions inflammation of the urethra, joints, and eyes, takes place without any true contagious gonorrhœal disease; and that on the other hand, inflammation of the joints and eyes which might not otherwise occur, arise from ordinary gonorrhœa. Syphilitic iritis, or inflammation of the eye, is evidently as much a usual secondary form of venereal disease as cutaneous eruptions, sore throat, and disease of the periosteum and bones; while the inflammation of the

eyes and joints following gonorrhœa seems to arise in particular constitutions only. The subject, however, is one which requires further consideration; for if it be established that inflammation of the eyes and joints often takes place from gonorrhœa, the violent and destructive inflammation of the conjunctiva which sometimes accompanies that disease may be admitted to arise from its constitutional influence as much as from the contact of the purulent discharge of the urethra to the surface of the eye. It is to be observed that these inflammatory affections of the joints and eyes accompanying or following gonorrhœa generally occur in younger men, who, if not of scrofulous constitution, are not distinguished for soundness of constitution or vigorous health. They do not appear to be sufferers from rheumatism before these attacks, but when once they have been subjected to them they are liable, sometimes for years, to relapses or returns. It should not be forgotten that Dr. Vetch appears to have been the first to observe this form of inflammation of the eye in connection with gonorrhœa. In his treatise on Diseases of the Eye, published in 1820, the following case is recorded, which, with the observations following it, proves that he was fully cognizant of the nature of the disease:—

“Major —, ætatis 25, contracted gonorrhœa in July 1809. In about a fortnight after the appearance of the disease, he was seized with the usual symptoms of *hernia humoralis*. As these abated, pain and swelling commenced in the right knee, and being at this time under the necessity of travelling in an open carriage for a couple of days, at the end of the journey the pain and swelling had extended to the other knee, to the foot and toes, especially the articulation of the great toe. Suffering under excruciating pain, and wholly deprived of the use of his limbs, he came under the care of Sir Henry Hallford: but no treatment seemed to possess any power in removing the complaint; and, in addition, his right eye was suddenly

attacked by a very violent inflammation, which threatened destruction to the organ. Having given up the use of medicine, he went to the country for the restoration of his health, and after being there three weeks, the gonorrhœa again increased in the urethra without any abatement of the other symptoms. The swelling and stiffness of the joints rendered him still scarcely able to crawl without assistance. The use of the warm bath and a residence by the sea was recommended. He experienced, however, little apparent benefit from the former, but after a very tedious convalescence of two years, he found himself able to join his regiment in Spain. From this time he recovered the wonted use of his limbs, and experienced no return of his complaint, though exposed to all the hardships of the campaign of 1812, memorable for the victory at Salamanca, and the retreat from Burgos. After exposure to a current of air in a state of perspiration, he was seized with an intermittent fever, and obliged to return to England, and at this time he had some increase of the stiffness of his joints. He continued to suffer from ague, and an impaired state of health, for nearly twelve months, when he returned to the active duties of his profession, and for some time enjoyed a perfect state of health, and the free use of all his joints, till December 1814, when he again contracted gonorrhœa, with symptoms of unusual violence. In a fortnight the discharge began to abate, and violent pain with swelling attacked the large toe, and metatarsal ligaments of the toes of the right foot. The disease then proceeded to attack the knees, with the same violence of pain and swelling as on the former occasion. As the violence of the symptoms began to abate in the knees, the left eye was attacked by violent ophthalmia, and excited great alarm for its safety.

“I saw him in his convalescence from both these severe attacks of gonorrhœal inflammation. The last inflammation of the eye appeared to have had its seat in the sclerotic coat, and on examining it more closely, I found an irregular and contracted pupil, with some opacity of the capsule of the lens, and adhesion between it and the iris; and on causing him to shut the sound eye, the vision of the left was found very

much impaired. Under the use of belladonna, and the corrosive muriate of mercury, the eye has recovered beyond what I encouraged him to expect.

“Great thickening of the synovial membrane of the knee-joints still remains, and he is incapable of standing or walking. On the first attack, the right eye became the seat of the ophthalmia, on the second the left; in neither was there any symptom of purulency or chemosis to indicate disease of the conjunctiva. It ought to be observed, that the urethra is still subject to returns of gonorrhœal discharge.

“In this case two important features present themselves; the first is, that the disease in the urethra was neither suppressed nor modified by this attack of inflammation of the eye; the second, that the last inflammation of the eye was decidedly a case of rheumatic inflammation of the sclerotic coat, and not of purulent ophthalmia; and this last is an event of more frequent occurrence, though more liable to be overlooked in its connection with the gonorrhœa, than purulent inflammation of the conjunctiva.

“Although the inflammation may attack the sclerotica without the conjunctiva, it is seldom, I believe, that the gonorrhœal action is translated to that membrane without attacking the sclerotic coat also, and it is this combination which renders it different both from Egyptian ophthalmia, and from gonorrhœal ophthalmia produced by inoculation. In some respects it may be said to exhibit less violent symptoms than either of these diseases, but is a more rapidly or perhaps the most disorganizing form of any inflammation that attacks the eyes. It does not yield to the same treatment; we have often neither the time nor the means of preventing the destruction of the cornea. In its external appearance it differs chiefly from that produced by ophthalmic virus, in the œdema being chiefly confined to the conjunctiva where attached to the eye, producing that state which we call chemosis, so that the eye itself is seldom concealed from observation, as is most generally the case in the unmitigated state of the other. The discharge is less copious, of a more viscid consistence, and of a deeper yellow colour; but with

these more favourable symptoms there is often more intolerance of light, a greater tendency in the disease to attack the internal parts of the eye, as well as the rapid destruction of the substance of the cornea by slough or ulceration.

“Instead, however, of considering even this purulent inflammation of the conjunctiva as a proof of metastasis, in the strict sense of the word, of the disease from the urethra, I am doubtful even if this last be not a similar manifestation of a peculiar rheumatic affection, produced by over exertion of the seminal and muscular systems, especially if followed by exposure to cold. As a disease, it seems to unite the two forms of rheumatism already noticed, and is of all the species of that complaint the most untractable, whether regarded in its local symptoms or in the protracted hold which it maintains over the constitution of the patient. I have now seen six cases of the disease, in each of which there has been a return of the complaint after sexual intercourse, and when nothing but this circumstance could warrant the supposition of the patient having received a fresh infection. In all these cases, any aggravation in the inflammation of the other parts has never been accompanied by any suspension of the gonorrhœa; on the contrary, the discharge generally increased.

“A patient now under my care for the second attack of this complaint, to whom I have suggested my doubts of his ever having contracted a venereal infection, has expressed his conviction to be the same: it is worth remarking, that on observing to this patient that I had never seen a similar case without some affection of the eye occurring along with it, he immediately said that from the time of his first attack he never had seen objects so distinctly as before, and I found, on examining his eyes, that the capsule of the lens had become opaque in both. A well-marked case and one of great suffering occurred in the person of a professional friend, who, in a few days after his first attack of gonorrhœa, was seized with very violent purulent inflammation of both eyes, which, until I saw him, he had attributed to the accidental conveyance of the matter from the urethra. He has since had another attack.

“The disease I think may be said to be one of gonorrhœal inflammation, and to denote its general nature we may give it the specific term of gonorrhœal rheumatism; it may be defined as a rare combination of both forms of that complaint, characterized by the loss of muscular substance, and thickening of the synovial membranes, a frequency of pulse, the other functions being very little disturbed.”

The treatment of this inflammation of the eye must be varied according to the nature and violence of the symptoms. Dr. Mackenzie, who seems to have seen the disease more frequently in its aggravated form, says that “repeated and copious venesection, leeches, calomel with opium in frequent doses, so as rapidly to affect the system, and the application of belladonna,” should be the treatment. Mr. Lawrence observes that—“This affection must be treated by the abstraction of blood, general or local, and by other corresponding measures. If the inflammation be considerable, if it should occupy both eyes, and the patient should be young, robust, and plethoric, free general bleeding will be required. Cupping and leeches will suffice in the milder instances. Warm local applications are generally the most agreeable to the patient’s feelings: the poppy fomentation answers the purpose very well. Exclusion of light is absolutely necessary so long as the intolerance continues. When the inflammation is checked by these measures, blisters may be advantageously applied, and the cure may be completed by the administration of Plummer’s pill once or twice a day, with mild aperients and a regulated diet. Colchicum is often used with advantage on account of the rheumatic symptoms which accompany this affection; and the eye may be expected to participate in the benefit, although the remedy cannot be depended on as a means of counteracting dangerous inflammation of the organ. The same observation is applicable to residence at the sea-side

and warm bathing, which are more advantageous to the lingering arthritic ailments, under which patients frequently suffer so long in these cases, than to the ophthalmic affection."

In Sir Benjamin Brodie's two cases "repeated blood-lettings and the use of mercury" had been resorted to in one, and "copious bloodletting and the exhibition of mercury" in the other with success. That bleeding and mercury may be required in some, or perhaps in many of these cases cannot be denied, but I am convinced that in others less violent and more appropriate remedies should be used. Mr. Lawrence, it appears from the above, recommends mercury more in the alterative form, although in one of his recorded cases, in which "the anterior chamber was filled with a light yellow transparent substance like jelly," he resorted to the "free use of mercury." In another, however, in which there was "dulness of the iris, irregularity of the pupils from adhesions, slight haziness of the cornea, and dimness of the sight," he relied on "a course of Plummer's pill," after cupping, leeches, and blistering; and in other cases of equally unequivocal nature, he also trusted to the same medicine. Sir Benjamin Brodie relies on *colchicum* in these affections generally, giving about half a drachm of the *vinum radicis colchici* three times a day; and where the inflammation is accompanied by rheumatic inflammation of the joints it is a valuable remedy. In severe cases where the iris exhibits unequivocal symptoms of active inflammation, and especially where effusion has taken place into the chamber of the aqueous humour, or when vision is greatly impaired from extension of the inflammation to the retina, mercury must be given freely and effectually; but in less active inflammation, and especially in those cases where the cornea is more the seat of the disease, mercury must be given as an alterative only, or perhaps altogether dis-

pensed with. In cases where the inflammation is of languid character, and the patient a person of constitution deficient in vigour ; or where there is conclusive evidence of scrofulous disease or tendency, I prefer iodine, and give the iodide of potassium in doses of five or even as much as ten grains three times a day ; and if after the first stage of inflammation there is a feeble pulse with corresponding want of action in the capillaries, I give the iodide in decoction of bark with some tincture of the same, or the bark or quinine alone. In some cases where the symptoms are acute and the iris much engaged, turpentine may be tried ; and in more chronic cases, where other remedies have failed, guaiacum may be given. Sarsaparilla also is a resource under similar circumstances. As in other forms of acute inflammation of the eye requiring depletion and mercury, the treatment of this one, when of the same character, should be commenced with antimonials, either alone or in combination with the mercury. Locally, belladonna should be freely used, although the pupil will not at first yield to its influence, and in the more advanced stages blisters may be applied. The diet, clothing, lodging, and place of residence of the patient, must be well considered, and every arrangement calculated to sustain and improve the general health recommended. In refractory and chronic cases change of climate becomes necessary.

ON RHEUMATIC INFLAMMATION OF THE EYE.

OF all the subjects upon which authors on diseases of the eye have written, there is not one requiring so much to be reconsidered as what is called rheumatic ophthalmia or rheumatic iritis. On perusing articles prepared with a view to the consideration of the nature and treatment of this form of inflammation, the reader is led, from the positive and unhesitating tone adopted, to believe that the facts adduced respecting it are admitted, and the reasonings and treatment founded on them adopted: this, however, is a mistake. Any one carefully examining these treatises must perceive that the writers have not mastered the subject or satisfied themselves as to the correctness of the views they entertain or the opinions they advance. Much assumed to be true has not been proved, and many conclusions suggested by mere theories remain to be recognized as correct. In fact, the precise form of disease to which the appellation of rheumatic should be restricted remains to be indicated in distinct characters, and the real amount of influence exercised by constitutional derangement upon the local malady remains to be determined. In other words, it is required to know what is meant by rheumatic inflammation, and what is the nature of the forms or varieties described under the title of rheumatic ophthalmia, scleritis, sclero-iritis, catarrho-rheumatic ophthalmia, and rheumatic iritis; a description of information not perhaps to be easily acquired, while the more general disease called rheumatism remains a subject of doubt as to its nature, seat, and origin. It seems to be assumed that rheumatic inflammation of the eye has its

seat more particularly in the sclerotic coat, apparently from a belief that rheumatism generally affects the fibrous membranes, of which the sclerotic is one. It remains, however, to be proved that in this disease the ligaments and tendons about joints, or the fibrous apparatus of other organs, are the parts first attacked, or indeed those attacked at all; except in consequence of their connection with the serous, synovial, or muscular structures engaged in the disease. That the sclerotic is not more the seat of this disease than the other textures of the eye, I am convinced, and the sooner the notion of its being so is abandoned the better; because it has the effect of diverting the practitioner's attention from the more important consideration that the whole of the organ is engaged and the parts essential to vision are in great danger. I have already observed that "in all cases of acute inflammation of the eye, the sclerotic exhibits increased vascularity;" and inflammation, caused or modified by rheumatism, affords no exception to the rule. As one inflammation of the eyeball has been called iritis, because the changes in organization caused by it are particularly conspicuous from that part being so visible, another is called sclerotitis, because the enlarged red vessels are displayed in a remarkable manner in consequence of the whiteness and semi-transparency of that structure.

In the study of rheumatic inflammation of the eye two points demand particular consideration: first, whether the visible changes in the organ are so peculiar that they prove the distinct nature of the disease; and secondly, whether constitutional symptoms exist sufficient to establish for it a distinct or specific character. That inflammations of the eye assumed to be rheumatic, and therefore so called, do present appearances different from those observed in other inflammations cannot be denied, but that all such are so distinguished can scarcely be admitted.

The vascularity of the sclerotic has been considered by Mr. Wardrop as characteristic of this modification of inflammation of the eye, and "sufficiently striking to enable an accurate observer to distinguish it from other inflammatory affections of that organ. The red colour," he says, "which the albuginea acquires in this inflammation is not the bright crimson which accompanies the inflamed cornea; it acquires a brick red tinge, or an admixture of yellow with crimson red, and this peculiarity of colour is probably produced by the serous part of the blood being tinged with bile, an effect likely to take place from the marked derangement of the biliary organs which usually accompanies this disease. The shade of yellow, however, varies a good deal, being in some cases very remarkable, and in others much less perceptible. The bloodvessels are generally equally numerous over the whole white of the eye, passing forward in nearly straight lines from the posterior part of the eyeball, and advancing close to the cornea; but neither passing over it nor leaving the pale circle around it, which is so striking when either the choroid coat or iris is inflamed. If the vessels be closely examined, the general redness will be found produced more from numerous small ramifications than a few large trunks." I quote from his communication on rheumatic inflammation of the eye, published in the 10th volume of the Medico-Chirurgical Transactions. I have already, in describing the symptoms of inflammation of the eye, particularly explained the appearance which the increased vascularity of the sclerotic presents, and have shown that it depends upon the natural arrangement or distribution of the vessels of that structure. I have now to observe that in all inflammations of the eye, whether modified by constitutional disease or not, the vascularity must be more or less of the same character: that is, it must consist of distinct red vessels converging to the

cornea and round the margin of that part, forming a zone or circle of general redness by their minute subdivision and ramification. I have already observed that this characteristic vascularity is conspicuous in syphilitic iritis, and it is equally so in simple uncomplicated inflammation in the earlier periods of life as well as in inflammation from injury or irritable ulcer of the cornea. It is, however, often obscured or rendered indistinct by co-existing inflammation and vascularity of the conjunctiva, which spreads over the sclerotic, hides the vessels of the latter structure, and leaves the practitioner in doubt as to its condition. This, I think, most frequently takes place in those cases which are supposed to be of rheumatic nature, or which are really so ; and hence the confusion respecting diagnosis founded on the sclerotic vascularity in this form of inflammation. The direction or arrangement of the vessels therefore affords no evidence to determine whether the inflammation is or is not rheumatic. The tint or colour of the inflammatory vascularity appears to be considered peculiar in rheumatic inflammation of the eye. Mr. Wardrop, as above quoted, says it is "a brick red tinge, or an admixture of yellow with crimson red ;" but I would not recommend the practitioner to place much reliance on this as a means of ascertaining whether the disease is rheumatic or not. It is true that in many of the cases assumed to be rheumatic the colour of the sclerotic vascularity is different from that in acute syphilitic inflammation, or in recent inflammation from injury or irritable ulcer or wound of the cornea ; but this is owing to other causes, and not to any influence exercised by specific constitutional disease. I have stated already in a former communication, that in simple acute inflammation of the eye, the sclerotic vascularity, "instead of presenting the dull red of venous distribution, as it does in conjunctival or other inflammation, exhibits the bright pink or

scarlet tint of arterial blood ;" and the fact is, that this characteristic florid vascularity of the sclerotic exists in all cases in early life where the inflammation is recent or acute. In more advanced life, however, and in cases where the inflammation has existed for some time, or is of chronic character, the vascularity is more of a blue or purple tint, or it is, as Mr. Wardrop says, " of a brick red tinge, or an admixture of yellow with crimson red." The cause of this appears to me to be, that in the more chronic forms of disease the veins become enlarged as well as the arteries ; and in the more advanced periods of life the sclerotic, having become more opaque and yellow, in common with all the other gelatinous structures, presents an appearance very different from that which it assumes in youth or early life. In other words, the aspect of an eye for some time inflamed, must be and is very different in old age from that of one recently attacked and in a person of youthful and vigorous frame. In this way I account for the generally entertained opinion that in rheumatic inflammation of the eye the sclerotic presents a peculiar or characteristic vascularity, it having been adopted more from observation of disease in advanced than early life. At the same time, however, that I am of opinion that there is nothing so peculiar or characteristic in the vascularity of the sclerotic in rheumatic inflammation as to be sufficient to enable the practitioner to recognize from it alone the true nature of the disease, I am also of opinion that the vascularity both of the sclerotic and conjunctiva is in general greater than in simple, uncomplicated idiopathic, or syphilitic iritis.

Having discussed at greater length than may seem necessary this question as to sclerotic vascularity, because upon its decision turns in a great degree the question of the true pathology of the disease, I have now to consider the changes which take place in the other structures. It is

stated by Mr. Wardrop in the communication which I have already quoted, that "as the disease advances the cornea becomes dull and turbid, and sometimes there is even a considerable degree of obscurity which does not appear in the form of a distinct speck, but of a general cloudiness, more opaque in the centre and diminishing towards the circumference." This is, I believe, generally the consequence, but I do not think that from this appearance a practitioner would be justified in confidently pronouncing a case presenting it to be of rheumatic character, even if accompanied by the sclerotic vascularity above described; because, although in simple idiopathic and syphilitic inflammation, the cornea is, in the majority of cases, transparent, it is sometimes more or less clouded. In describing the inflammation of the eye which follows or accompanies gonorrhœa, and forms part of what is not inappropriately denominated gonorrhœal rheumatism, I noticed particularly the cloudiness of the cornea, and stated that the disease presented the characters of corneitis; and I think that in inflammation of the eye caused or modified by rheumatism the cornea is also clouded. It is not perhaps the gray cloudiness which takes place in the inflammation of the cornea known as corneitis, but a muddiness or watery haziness not easily described, which more or less obscures the iris behind it. There is another form of corneal obscurity which occurs in this as in other inflammations of the eye, and has been noticed as taking place more frequently in inflammation caused or modified by gout. I alluded to it when describing inflammation of the eyeball in general, and shall have to notice it again. This is a gray circle occupying the margin or circumference of the cornea, within the pink zone of the sclerotic, and not extending towards the centre, but circumscribed or defined. It is something like the permanent circular opacity called arcus senilis, which takes place in the eyes

of some persons without inflammation or other disease, or even being a consequence of old age, but it is not so broad or so white and opaque. This gray zone is not symptomatic or characteristic of rheumatic or gouty more than any other form of inflammation, but depends on the age of the patient, being an appearance frequently seen in old persons attacked by inflammation of the eye of any character, and seldom if ever observed in early life.

The lining membrane of the chamber containing the aqueous humour is evidently affected in rheumatic as it is in syphilitic, and perhaps more or less in all inflammations of the eye, or as it is in corneitis. The loss of transparency of the cornea above alluded to may perhaps to a certain extent be attributed to the opacity of this membrane covering its internal surface; although I cannot say that I have generally seen the opaque specks or dots on this part in this form of inflammation which I have described as occurring in syphilitic iritis and corneitis. The adhesions which take place between the margin of the pupil and the membrane of the aqueous humour where it covers the front of the capsule of the lens, and the streaks of opacity which sometimes remain there, also prove that this membrane is affected. In slight and transient attacks of inflammation which often take place in persons suffering from the rheumatic diathesis or constitution, the membrane of the aqueous humour is, as I shall have hereafter to explain, the structure particularly if not exclusively engaged.

The iris is always inflamed in rheumatic inflammation of the eye, and sometimes very acutely. It loses its power of motion, ceases to act or yield under the influence of belladonna, becomes altered in colour, and contracts adhesions to the surface of the capsule of the crystalline lens. Dr. Mackenzie, in alluding to this, observes, that "the colour of the iris is next observed to undergo a

change; first, in the lesser circle, which becomes of a dark hue, and afterwards in the greater, which grows green if it had been grayish or blue, and reddish if it had been dark coloured. This change of colour is a never-failing index of the substance of the iris being inflamed, and, as has already been mentioned, is apt to continue after all the other symptoms of iritis have been subdued. As soon as it is observed to have taken place to a considerable degree in the greater circle, the iris swells and projects towards the cornea, while the pupillary margin losing its sharply defined edge, seems somewhat thickened, and is turned back towards the capsule of the lens." All this is true, but I am convinced that these appearances may take place in inflammations of the eye not of rheumatic character, and may be absent in true rheumatic inflammation. They cannot therefore be considered sufficient to justify a confident opinion that the inflammation is undoubtedly rheumatic if unaccompanied by other evidence of the existence of that constitutional disease. That the choroid and retina, and ultimately the crystalline lens, partake of the common inflammation in this disease, is fully proved by the defect or loss of vision which takes place in it, and the occurrence of cataract in cases terminating unfavourably. The disease even appears to arise in the retina and choroid in some cases, commencing with what are called amaurotic symptoms, before the sclerotic vascularity or changes in the iris appear. The practitioner will therefore not forget that he has to treat a formidable inflammation of the whole organ, and not an insulated one of the sclerotic or iris alone.

The pain in what is called rheumatic ophthalmia, scleritis, or iritis, is not the same in degree, extent, or continuance, as in either idiopathic or syphilitic inflammation. Mr. Wardrop thus describes it, and I think correctly—"The seat as well as the kind of pain affords striking

characters of this peculiar affection. Generally the chief seat of pain at the commencement of the disease is in the head, though it sometimes also affects the eyeball itself. The pain is usually most severe in the temple of the affected side, but it is often seated in the brow, the cheek-bone, the teeth, or the lower jaw. Sometimes the pain is precisely confined to one-half of the head, and sometimes there is a severe pain in the cavity of the nose, or in the ear. These pains are more of a dull agonising kind than acute; and though in this disease the pain be unceasing, yet it varies much in degree, coming on at times in very severe paroxysms, and recurring with great violence when the head is bent downwards. Sometimes the pain is excited by merely touching the scalp, and the patient is unable to rest his head on the affected side, or even lean it on a pillow. The pain in most cases is remittent, the paroxysm coming on at four, six, or eight o'clock in the evening, continuing during the night, being most severe about midnight, and suffering an abatement towards morning." The nature and amount of the pain thus accurately and faithfully described, is in my opinion no more to be considered peculiar to inflammation of rheumatic character, or as constituting a characteristic or diagnostic symptom of it, than the sclerotic vascularity and changes in the iris already noticed are to be relied on to distinguish this form of inflammation from every other species. Not only do I believe this, but I am convinced that true rheumatic inflammation may and does take place unaccompanied by this agonising and remitting pain extending to the surrounding parts; which, as I shall have hereafter to explain, is of neuralgic nature, and arises from the branches of the fifth nerve becoming implicated in the disease. When this amount and character of pain exists in inflammation of the eye, it is accompanied by intolerance of light, sometimes so great that the patient cannot bear the slightest

exposure to it ; some, therefore, set down intolerance of light as a characteristic symptom of the rheumatic inflammation. It is not, however, a uniform, or perhaps even a usual consequence in this form of disease, no more than it is in other species.

Having in the preceding paragraphs endeavoured to prove that the appearances, changes in vascularity or structure, and the symptoms described as characteristic or diagnostic of inflammation of the eye caused or modified by constitutional rheumatic disease, do not appertain to it exclusively, it remains to explain what should be held to constitute true rheumatic inflammation of the eye, and to what precise condition of the organ or of the system at large the term should be rigidly restricted. It is obvious that unless it can be distinctly established that there is such a disease, or modification of disease, all vague notions or unsupported assumptions of its existence, resting on reasonings from analogy or theoretical pathology, should be abandoned as not only useless but mischievous. That rheumatism attacks the eye as it does the joints and other organs and structures ; or in other words, that the eye, as well as these parts, becomes inflamed in consequence of the existence of that peculiar condition of the system or constitution called rheumatic, can, I think, scarcely be denied ; neither can it, in my opinion, be denied, that inflammation produced by exposure to cold or wet, or even by injury, may be and often is so modified or influenced by the same constitutional influence that it assumes a peculiar condition, and in its progress and consequences presents peculiar characters. Instead of yielding to depletion and arrest of active nutrition, with such medicinal agents as reduce vascular action ; or of spontaneously subsiding after the usual period of active inflammation, the rheumatic form of disease often remains unchecked, or even appears aggravated by the treatment

adopted for its removal; and if mitigated or subdued, returns unexpectedly and without apparent cause. Although, as has been already stated, the specific nature of the inflammation cannot be recognized with certainty from the changes in structure or the symptoms, it may be apprehended from the severity of the attack, the greater degree of pain, and its extension to surrounding parts, as well as from intolerance of light and general constitutional disturbance. Neither these peculiarities, nor any other modification of symptoms, will, however, in my opinion, justify the practitioner in pronouncing positively that the disease is true rheumatic inflammation of the eye unless there be unequivocal proof of the previous or present existence of rheumatic constitution or diathesis, as indicated by inflammation of the joints, with the peculiar accompanying fever, or that disturbance of the system called acute rheumatism; or unless there be at least transient shifting pains of joints or muscles with brief febrile paroxysms, perspirations, lithic deposits in the urine, and general ill health. It should not be assumed that severe inflammation of the eye is of true rheumatic nature, because the patient may have occasionally experienced temporary pains of some of the joints or muscles; there must be some more conclusive evidence to justify the practitioner in assigning a distinct specific character to the disease. I am, in fact, convinced that unless this inflammation be part of a general rheumatic disease affecting the system the term rheumatic is altogether inapplicable to it, and should be abandoned. To call an inflammation of the eye rheumatic, because it appears to be situated in the fibrous membrane or sclerotic, is nothing more than an intimation that the disease is to be considered of this nature merely because it attacks that structure, and is obviously made from an assumption, unsupported by fact, that these textures are peculiarly subject to such disease.

Rheumatic ophthalmia, it is said, "frequently occurs in individuals who have never suffered from rheumatism in other parts of the body." If so the disease so called is not rheumatic. Rheumatic inflammation of the eye may perhaps sometimes, but not frequently, occur without inflammation of joints or other organs, but not without constitutional rheumatic disease. If that be not present, the local inflammation is destitute of the specific character.

Under the title of catarrho-rheumatic ophthalmia a species or variety of rheumatic disease of the eye has been described by some writers. I cannot, however, discover the grounds upon which any such distinction can be with safety founded. That both the conjunctiva and sclerotic may be and often are inflamed at the same time, and that such double inflammation may be modified by rheumatic constitutional disease or diathesis, cannot be denied; but that such inflammation is entitled to the character of a peculiar or specific form of disease cannot, I think, be proved. If such distinctions be admitted no limit can be set to the multiplication of species or even genera of diseases of the eye in nosological arrangements. Mr. Mackenzie says—"This compound ophthalmia is one of the most common and also one of the most severe and dangerous diseases of the eye. In old persons especially it is often the source of permanently diminished vision, and not unfrequently of entire loss of sight in the eye attacked." This is true, but I think it may be better to say that simultaneous severe inflammation of both conjunctiva and sclerotic frequently occurs, especially in old persons; and indeed it may perhaps be said that the eyeball, and consequently the sclerotic, is never inflamed without more or less of corresponding inflammation of the conjunctiva. A sensation of sand between the eyelids and eyeball, a secretion of puriform mucus, nocturnal circumorbital pain, conjunctival and sclerotic inflammatory vascularity, intolerance

of light, and profuse lachrymation, are the symptoms enumerated as distinguishing this form of disease, followed by vesicles, or what are called *phlyctenulæ* on the conjunctiva covering the cornea, passing into ulceration, and leading to deposition of pus in the corneal structure, and to hypopium or onyx in the chamber of the aqueous humour. All this, however, may take place without any condition either of the eye or the constitution which would justify the practitioner in attributing the disease to rheumatism. That a person advanced in life and of feeble frame or languid and unhealthy constitution should be attacked by conjunctival inflammation is nothing extraordinary; neither is it anything very singular that in such cases the conjunctiva covering the cornea should have the little vesicles formed upon it which those who are fond of giving hard names to things call *phlyctenulæ*. No more is it extraordinary that these vesicular elevations should pass into irritable ulcers, and that in consequence the sclerotic should become engaged and display its characteristic inflammatory vascularity. It is also to be expected that under such circumstances there should be a sensation of sand under the eyelid, scalding lachrymation, circumorbital pain, and intolerance of light. But it does not follow that this state of disease is necessarily caused by rheumatism, or even that it is modified or influenced by rheumatic constitution or diathesis, although it may in certain cases be so influenced. The existence therefore of a distinct species of inflammation of the eye entitled catarrho-rheumatic ophthalmia, cannot, in my opinion, be established.

It remains to be considered how far the treatment of true rheumatic inflammation of the eye should differ from that resorted to in simple uncomplicated or syphilitic inflammation; for it is obvious that a disease caused or modified by some unusual and unhealthy state of the system or constitution must require treatment adapted to

that condition. Depletion and arrest of nutrition, effected by denial of nutritious food, will often not only fail to reduce inflammation thus caused or modified, but will in some cases have a contrary effect, and rather protract the disease by increasing the constitutional derangement; and mercury will fail to exercise its usual influence. The practitioner must therefore be prepared to substitute other remedies, and to rely on other resources. It is evident that the first matter for deliberate consideration is the constitution or general health of the patient, and the evidence his symptoms and the vital operations of his frame afford of derangement of the functions of important organs or of the processes of digestion, absorption, nutrition, and secretion. The next subject for consideration will be how far such interruption of healthy action is to be attributed to that state which is called rheumatic, and what that condition of the system really is. An inquiry as to the real nature of the disease called rheumatism would be misplaced here; the reader must therefore be referred to works written expressly for that object to refresh his memory in this respect. It cannot, however, be considered misplaced to remind the practitioner that when called on to treat a case of inflammation of the eye preceded or accompanied by true constitutional rheumatic disease he has to apply himself to the removal of that disease with as much assiduity as he does to the reduction of the local inflammatory action. I do not wish it to be understood that I consider the presence of the rheumatic fever necessary to prove the rheumatic character of an inflammation of the eye; I only wish to intimate that the peculiar state of constitution called rheumatic diathesis is in my opinion a necessary evidence towards establishing the existence of such character. Rheumatic fever, with inflammation of joints or other organs, is probably in all cases followed, for some time at least, by the rheumatic

diathesis ; and the same diathesis, as indicated by transient shifting pains, brief febrile paroxysms, and impaired gastric and renal functions, takes place in some instances without any such preceding fever. It will therefore be necessary to inquire carefully respecting the previous or present existence of this state of constitution before adopting any plan of treatment, and even to inquire whether there exists a state of general health analogous to that which causes or predisposes to rheumatic disease.

The treatment of true rheumatic inflammation of the eye must be conducted on the same principles as those already laid down for the treatment of the other forms of inflammation, but with such modifications as the constitutional derangement demands. Bleeding, if resorted to, should be practised with still more caution and discrimination than I have suggested in alluding to its employment in simple or uncomplicated inflammation of the eye. The abstraction of large quantities of blood in acute rheumatism is not admitted to be the safest or most successful practice, neither can it be considered so in rheumatic inflammation of the eye. I do not deny that cases may arise in which general bleeding may be required in the treatment of robust and plethoric persons, but its indiscriminate use must be condemned. Local bleeding by the application of leeches to the temple or over the cheek-bone, is not only to be permitted, but even appears to be more efficacious than in other forms of inflammation ; and considering the matter theoretically, it may be thought preferable as a means of abating vascular action without altering the mass of circulating fluid in quality or quantity. Whatever doubts may be entertained by some as to the beneficial effects of local bleeding in inflammation of the eye, or however difficult it may be to explain in a satisfactory manner such beneficial effects if they do occur, experience is in favour of the practice in rheumatic inflam-

mation. The application of six, eight, ten, or twelve leeches, according to the age and strength of the patient, is therefore to be generally adopted, and the repetition of them every day, or every second day, until the activity of the acute stage of the inflammation is subdued, is often necessary.

Purgatives are not of course to be resorted to or relied upon with a view to the removal of the inflammation, but it is desirable that the contents of the intestines should be removed at the commencement of the treatment to interrupt nutritious absorption, and discharge whatever may have accumulated in the alimentary canal. If at the same time the secretion from the liver can be by the same means increased and improved so much the better; but as I have already stated my opinions fully as to the value of purgatives in the treatment of inflammation of the eye, it is unnecessary to repeat them here. It is only necessary to add that if the common coarse routine practice of indiscriminate purging be objectionable in ordinary cases, it is doubly so where the constitution is under the influence of disease of peculiar or specific character liable to be aggravated by disturbance of the healthy functions of the alimentary canal. Five or six grains of compound colocyath pill, with two or three of calomel and two or three of extract of hyoseyamus, appears to answer every purpose, and may be repeated if necessary until the effect required is produced. Adopting the hypothesis that the rheumatic diathesis is caused or perpetuated by the detention in the system of some pernicious ingredient which may be extricated by secretion, purging is entitled to more consideration; affording as it does an outlet by the stimulation of the mucous membrane of the intestines. With this view, Dr. Todd, in his excellent Croonian Lectures on Gout and Rheumatic Fever, suggests that "the purgatives which seem most applicable are those which pro-

duce watery evacuations. The combination of sulphate and carbonate of magnesia answers very well, the addition of the alkaline earth serving to neutralize some of the free acid which is so abundantly secreted. Colchicum," he continues, "is useful as a purgative, and if employed in large doses, exerts a powerful action on the intestinal canal, but the employment of it is not devoid of serious objections. The tartrate of potass is also a useful purgative."

In enumerating the remedial resources to be relied on in the treatment of simple inflammation of the eye, I have had to direct attention to the beneficial operation of antimonials, either in reducing the activity of the circulation by causing nausea, or by promoting the discharge of pernicious matter from the system by cutaneous secretion. It is with the latter view I should suggest their use in rheumatic inflammation of the eye, and in combination with opium, especially as found in Dover's powder. A sixth or eighth of a grain of tartrate of antimony, with two or three grains of the *pulvis ipecacuanhæ compositus*, every four or six hours, seems to answer this purpose. Dr. Todd, in the treatment of rheumatism by sudorifics, considers Dover's powder among the best, or "the nitrate of potass, he says, may be given either in combination with opium and ipecacuanha, (a nearer approach to the original formula for Dover's powder) or in solution with minute doses of tartarized antimony. I am not," he continues, "in the habit of exceeding five or six grains of the nitrate of potass with one-eighth of a grain of the tartar emetic (to which if there be nausea a few drops of tincture of opium may be added) every four or six hours." Should, however, the severity or activity of the inflammation render the ultimate use of mercury necessary, the antimonial is to be combined with it. The *hydrargyrum cum creta*, with Dover's and James's powder, or the *pilula*

Hydrargyri, with powdered opium and tartrate of antimony, in appropriate doses, will answer, with whatever modification or addition the practitioner may consider suited to the peculiarities of the case.

Whatever opinions may be entertained respecting the value of mercury in the treatment of rheumatism generally, or however necessary it may be to administer it in a cautious and guarded manner under certain circumstances, it is obvious that in a severe attack of inflammation of the eye it must be resorted to freely and effectually. I have already explained fully the method of administering this remedy, and the quantity to be given in other forms of inflammation of the eye. In the rheumatic form its combination with antimony and opium, as just suggested, is to be preferred at the commencement; and when a full trial has been given to the sudorific plan, it may be continued in the usual combination of calomel and opium, as already explained. The practitioner will, however, recollect that he is not to place such reliance in this remedy in this form of the disease as he does in the syphilitic, or even in the uncomplicated or idiopathic varieties; and that he must often look forward to a protracted train of inflammatory symptoms demanding other plans of treatment and resisting the most powerful agents.

The other remedies available in the treatment of rheumatic inflammation of the eye have been noticed in discussing those to be resorted to in the syphilitic and gonorrhœal forms of the disease, as well as in the idiopathic and that which follows fever. Such are turpentine, iodine, colchicum, bark, sarsaparilla, and guaiacum. Of these it is difficult to say which is generally to be preferred. They are often resorted to empirically and without reference to any recognized principle, more perhaps in consequence of the failure of other measures than any confident reliance in their specific operation. Except turpentine, few of them

are resorted to in the first or acute stage of the inflammation, unless where depletion, antimonials, and mercury, are inadmissible from constitutional debility, or from the disease being of the nature of a relapse or return of a former attack. Of the turpentine in true rheumatic inflammation of the eye, I cannot say much from my own observation. Mr. Tyrrell, in his work on Diseases of the Eye, says he tried it in what he calls conjunctivo-sclerotitis, being the catarrho-rheumatic ophthalmia of others, to which I have alluded. He observes—"I have tried it, as I have done colchicum, in both stages of the disease, but have found it of little efficacy, so much so indeed that I now rarely prescribe it. I have known it occasionally serviceable in the second stage of the affection or when the conjunctivitis has been subdued; but I much prefer the small doses of bark and soda or of quinine to it, as more certain and safe remedies; whereas the turpentine is liable to produce severe and continued distress." This testimony should not, however, induce the practitioner to discard this remedy in cases suited to its administration. I have seen it, if not of decided benefit in cases assumed to be rheumatic, at least not injurious or causing any "severe or continued distress" when limited in dose and properly guarded. The admitted fact of its free absorption into the system and diffusion through the circulation, as proved by the secretion from the kidneys and the strangury it causes, is strongly in its favour as an antidote or counter-agent in a disease justly suspected to depend on a vitiated state of the fluids or even of the solids.

Colchicum has been extensively and freely employed in rheumatic inflammation of the eye, or in cases assumed to be rheumatic, without any very decided testimony in its favour. I have already said that Sir Benjamin Brodie relies on it in gonorrhœal rheumatism attacking the eye, and Mr. Lawrence speaks favourably of it. He observes—

“The well-known efficacy of colchicum in the treatment of certain rheumatic affections has led to its employment in this form of ophthalmic disease; and it has sometimes proved very efficacious. Twenty or thirty minims, or even a larger dose of the wine may be given, in combination with carbonate of soda or potash and some rhubarb, if an aperient is advisable, three times a day, or two or three grains of the acetous extract may be administered once, twice, or three times, in the twenty-four hours. If colchicum affords relief at all, it does so quickly.” Mr. Tyrrell observes—“Colchicum is so uncertain a remedy that I rarely employ it. I have, however, occasionally known it afford relief most rapidly; but I have often used it without its producing the slightest benefit, as regards the local affection. From the experience I have had respecting it, I should say that it rarely, if ever, does good, when any functional disorder of the stomach or bowels exists; or when the index to these parts—namely, the tongue, is at all loaded or foul; but that when the tongue is clean, and the secretions from the alimentary canal are proper, it will sometimes effect a cure more rapidly than any remedy I know of. I use it occasionally in the following way: I first act freely upon the bowels by some drastic purge, combined with mercury; and soon after I direct the patient to take half a drachm of the wine, combined with a small quantity of alkali and some narcotic; and to repeat the dose every six hours. I take care to see the patient after the second or third dose, in order to determine upon the continuance of the remedy; for if it produce nausea or affect the bowels, it seldom acts beneficially on the ocular disease, but if relief be obtained from the first two or three doses, a cure is usually promoted by perseverance in this treatment. When I prescribe the colchicum, it is usually in the early stage of the disease; not at the period at which I have recommended the use of soda and bark or

quinine; but whilst the conjunctival affection, as well as that of the sclerotic, exists." I have given colchicum in true rheumatic inflammation of the eye, as well as in those refractory and recurring cases generally considered rheumatic, and I think with advantage: but as I do not believe that vague and general expressions of approbation of a remedy from slovenly and imperfect observations of its effects are much to be relied on, I wish to leave the question of the value of this to future consideration. I reserve, however, some suggestions as to its administration until I come to notice its use in gouty inflammation of the eye, where it is perhaps more applicable than in the mere rheumatic form of disease.

To cinchona or quinine as a remedy in inflammation of the eye, I have already alluded in noticing the treatment of that form which follows fever; as to its use in rheumatic inflammation it is necessary to make some additional observations. It seems to operate in two ways: one, as a tonic by invigorating the constitution generally; the other, by some specific or antidotal influence, which it appears to exercise where the rheumatic diathesis or other constitutional derangement is present. Of its influence as a tonic or remedial agent capable of restoring the ordinary or healthy processes of absorption, nutrition, and secretion, after they have been interrupted, there seems to be little question; and therefore do we administer it when the frame is debilitated or enfeebled by disease, or denial of nutritious food; or where it is naturally deficient in vigour. With this view bark or quinine is given in the advanced stages of rheumatic inflammation of the eye, and even at its commencement, in some cases of relapse or recurrence of the inflammation before complete recovery from the consequences of former attacks. To enumerate the various forms in which it may be administered, under such circumstances, would be superfluous, as they

must vary according to constitution, age, and state of the stomach or other organs. Its specific or antidotal influence in the correction of the rheumatic diathesis or constitutional derangement is not perhaps as generally admitted as its merely tonic operation. Mr. Wardrop, in the paper already quoted, says—"The remarkable effects I have observed of cinchona in the cure of rheumatism of the joints first led me to employ it as a remedy in rheumatic ophthalmia, and it seems to possess as specific an effect in this disease as ague. From the disordered state of the stomach it should only be given in small doses: generally from five to eight, taken in a little warm water every two hours, or as often as the stomach can receive it is sufficient. It sometimes purges the bowels considerably, and when this effect is produced, I have not found it diminish its specific virtues. The good effects of this remedy are commonly soon seen, and its use may be persisted in according to the abatement of the symptoms." Mr. Lawrence observes—"Bark is sometimes serviceable in articular rheumatism, and it has been used with advantage in rheumatic ophthalmia," and that "it is often used with decided benefit where the state of the eye, especially in respect to redness, might lead us to suppose that antiphlogistic treatment would be more advisable." Mr. Tyrrell says—"I have found the most decided and rapid benefit from the use of small doses of bark and dried carbonate of soda (five grains of each) given about every four or six hours. This remedy," he continues, "was mentioned to me some years ago by Mr. Wardrop, and it is a very valuable one, inasmuch as I repeatedly find it successful after the continued but useless trial of other means. It appears necessary to employ the small doses to produce the beneficial effect; for in several cases I have known scruple or half-drachm doses administered without benefit; and the same patients recover quickly by resorting to the

smaller quantities." I have myself used bark and quinine freely, not only as a tonic in cases where debility and general derangement of health had been caused by bleeding, purging, mercury, and low living, but in cases of relapse, or where the disease has returned frequently at intervals of a year or more, and in which mercury had been so often used that it had ceased to operate beneficially, or was to be objected to on account of its too repeated administration. In this way it has also, I believe, been employed by most practitioners, not only in inflammation of the eye really caused or modified by the true rheumatic diathesis, but in those cases assumed to be rheumatic from their chronic and refractory character. This medicine has, in fact, been relied on from its known operation in arresting disease or exercising what is called a specific influence on it; and I think such reliance has been justified by the results. I have not, however, trusted to such doses as five grains of powdered bark as above recommended to be given in combination with soda, but have given full doses of the decoction with some of the tincture, or an equally efficient quantity of quinine. The addition of an alkali may be desirable to correct acidity of the stomach, if such exists, or if there be profuse deposits of lithates in the urine; and with this view the bicarbonate of potash is to be preferred to the soda. This is, however, perhaps, to be looked upon more as a temporary expedient than as a remedy for permanent application, the continued use of alkaline medicines, with a view to neutralize acids, being often but a substitution of one defective state of the fluids for another.

I have alluded to the value of iodine as a remedy in inflammation of the eye when discussing the treatment of syphilitic ophthalmia, and its claims to confidence in rheumatic inflammation, and in the chronic and refractory cases assumed to be rheumatic, appear to be equally strong

It may, therefore, be administered in the same way as there advised. The iodide of potassium may be given in solution; three, five, or even ten grains, three times a day; and it may be given in decoction of bark, if a tonic be required, or if the practitioner relies on the specific action of remedies to neutralize morbid ingredients either in solids or fluids: or the iodine may be given in combination with iron, the latter being often alone a useful resource in cases which resist the usual medicinal agents. The syrup properly made, is, I conclude, the preparation to be preferred, and one, two, or three grains, and even more, of iodide of iron, may be given three times a day in this form. The iodine may also be combined with mercury in those cases where inflammation comes on in persons suffering from chronic rheumatism, and where it is deemed necessary to give the mercury so as to produce its full effect. About two grains of the iodide of mercury with a quarter of a grain of opium, may be given three times a day with this view, or in smaller doses when its alterative action only is required. In less acute cases, I generally give five grains of Plummer's pill, or the same quantity of blue pill, with an eighth or tenth of a grain of tartrate of antimony at night, and five grains of the iodide of potassium in the morning and middle of the day.

In describing that form of inflammation of the eye which follows fever, I briefly noticed the use of guaiacum. It is, however, in rheumatic inflammation of the eye that this remedy, more or less relied on in the treatment of rheumatism in general, is entitled to a trial. The resin itself may be given in pill, with or without any addition which the practitioner may consider necessary to promote its salutary operation, or to render it agreeable to the stomach; or the mixture of the pharmacopœia, or the spirituous or ammoniated tincture may be preferred. I generally order the ammoniated tincture, to be taken in milk.

As to local treatment in rheumatic inflammation of the eye, it should be adopted or modified as suggested in alluding to the subject when considering simple uncomplicated inflammation. As pain more frequently attends the rheumatic form of disease, warm sedative stupes may be more necessary, and the extract of belladonna should be used for this purpose, as well as to cause dilatation of the pupil to prevent the formation of adhesions. A drachm of good extract of belladonna added to a pint of strong infusion of poppy heads seems to answer sufficiently well, with a daily painting of the lids and brow with the extract rendered sufficiently fluid for the purpose. Blisters appear to be indicated by their effects in rheumatism of the joints, and in practice they often seem to be of benefit. They may therefore be resorted to as directed when alluding to their use in simple inflammation. In the latter stages of the disease the *vinum opii* is sometimes dropped into the eye, and although it seems to be a practice little calculated to allay the internal inflammatory action, it sometimes affords relief, or at least does no mischief, where there is much scalding pain, intolerance of light, and profuse discharge of tears.

ON GOUTY OR ARTHRITIC INFLAMMATION OF THE EYEBALL.

NOTWITHSTANDING the frequent allusion to gouty or arthritic inflammation of the iris or sclerotic in treatises on diseases of the eye, exact information on the subject has been so sparingly afforded that some scarcely believe in the existence of any such species or modification of disease. This, however, is too premature an inference, and not to be adopted after due consideration. The descriptions given of the symptoms are, it is true, meagre, unsatisfactory, and often mere repetitions of the observations of others, not very remarkable for accuracy; but they are sufficiently precise and positive to establish the fact of such an inflammation being caused or modified by this peculiar constitutional condition or diathesis. Beer and other German writers appear either to have met this disease more frequently than surgeons in this country, or to have assumed that the more simple forms of inflammation, modified by age or constitution, are of this specific character: and hence the general recognition of its specific nature by systematic writers who place reliance on such authority; it is now, however, full time to have the question settled by observation and positive evidence. In fact, it remains to be determined whether or not the eye ever becomes primarily the seat of true gouty inflammation, as joints or other organs are; and also whether, when attacked by inflammation from the usual causes, the nature, progress, and results of that inflammation are influenced or modified by the presence of the gouty diathesis. I believe that the eye is sometimes attacked by gouty inflammation, even before any joint or other organ has been affected; be-

cause I have seen cases in which adhesions of the iris and other consequences of inflammatory action had taken place in persons who soon afterwards were subjected to regular gouty paroxysms, and who were predisposed to the disease by hereditary predisposition. I also believe that the eye is sometimes separately attacked, because I have seen cases in which severe inflammation of this organ has been preceded or followed by well-marked and unequivocal symptoms of gout elsewhere, and in which the paroxysm has passed off without on that occasion implicating any other part. The fact that inflammation of the eye has been and may be mitigated or arrested by inducing gout of the foot by external stimulation, or by its spontaneous appearance there, strengthens the evidence in favour of its distinct specific character. If indeed it be admitted, as it appears to be, that a joint becomes inflamed in consequence of the existence of the gouty diathesis, without any other exciting cause, there does not appear to be any difficulty in admitting that the eye may become inflamed under similar circumstances. Unacquainted as we are with the proximate or immediate cause of the inflammatory action in gout, we cannot say that it is restricted in its operation to one structure more than another: while, however, it is thus urged that the eye may be, and sometimes is, the seat of true gouty inflammation, and that this disease is the only cause of the attack, it must be admitted that inflammation induced by exposure to cold or wet, or even caused by accidental injury, may be so modified by that peculiar condition of the system known as the gouty diathesis, that it is very difficult, if not impossible, to distinguish the one from the other. That simple inflammation may be so modified or altered in character, and that it is frequently rendered unmanageable by such constitutional derangement, is unquestionable; and therefore is it necessary in all cases where gout may be suspected to

exist, to make inquiry as to its previous occurrence, or the probability of its appearance from hereditary predisposition.

Assuming it to be admitted that the eye may be the part upon which gout becomes concentrated, and that it may be inflamed in consequence; or that having become inflamed from exposure to cold or from accidental injury that inflammation is modified by the gouty diathesis, it remains to be determined whether the symptoms, appearances, changes in structure, and the consequences of this peculiar form of inflammatory action, differ from those which are observed in simple or idiopathic inflammation, or from inflammation caused or modified by rheumatism. In other words, it is to be determined whether the sclerotic vascularity, the corneal opacity, the changes in the iris, the impaired vision, or the loss of transparency of the lens which are observed in cases of gouty inflammation, are so peculiar as to justify a practitioner in pronouncing the disease to be of this distinct character, irrespective of general constitutional symptoms. I do not myself believe that any positive opinion can with safety be given on the subject from mere inspection, although appearances generally will justify a strong suspicion as to the nature of the malady; but as I have fully discussed this point, in treating of rheumatic inflammation, it is unnecessary now to repeat here the observations there made. It is only necessary to express again the opinion that these peculiar changes and appearances are owing to age more than to any specific influence. The sclerotic vascularity may be of a more dingy red, blue, or purple tint, than in simple inflammation; the cornea may be more clouded, and may even have its margin forming a gray circle; and the iris may be greatly altered in colour, with an adherent or a dilated pupil: yet the practitioner will not be justified in pronouncing the case to be one of gouty inflammation

without other evidence of which the presence of the constitutional disease or diathesis is the most conclusive. The pupil sometimes becomes permanently dilated, and the lens at the same time acquires that yellowish opaque condition which causes the peculiar appearance of the eye denominated glaucoma, yet although together with these there may be the lurid or purple vascularity of the sclerotic and a gray margin round the cornea, still it is not to be assumed that therefore the inflammation is arthritic. I have seen all these appearances in simple idiopathic inflammation from exposure to cold in aged persons who had never been the subjects of gout or rheumatism, and I have seen others who had regular paroxysms of gout or well-marked rheumatism, whose eyes presented appearances of a totally different nature; such as florid sclerotic vascularity, transparent cornea, and a contracted pupil adhering to a capsular cataract. I have also seen destructive inflammation in both gouty and rheumatic persons terminate in contracted and adherent pupil with capsular and lenticular cataract in one eye, and completely dilated pupil with greenish opacity of the lens, and the appearance called glaucoma, in the other.

Having endeavoured to explain the difficulty of distinguishing gouty or arthritic inflammation of the eye from other species or varieties by observation of the organic changes which the parts undergo, it remains to inquire whether or not a satisfactory diagnosis can be formed from a consideration of the effects of these changes on the sensations of the organ: whether, in fact, the disease can be pronounced of gouty character, in consequence of any degree or peculiarity of the pain, any remarkable intolerance of light, or any unusual defect or loss of vision. From my own observation I am of opinion that no characteristic modification of these symptoms is always present in gouty inflammation sufficient to

enable a practitioner to recognize the specific character of the disease without other evidence. Intolerance of light there generally is, and sometimes very great, but it is not always an urgent symptom; and if present cannot be considered a consequence of this form of disease exclusively, because it may occur in all. Pain, I believe, always accompanies the disease, and is generally severe and sometimes agonizing, with throbbing and sense of tension. This, however, cannot be considered characteristic of this inflammation, it being equally remarkable in the rheumatic and neuralgic forms, although sometimes absent in idiopathic and syphilitic disease. Loss or imperfection of sight, it is scarcely necessary to say, does not take place in any peculiar or characteristic way in gouty inflammation, and therefore no diagnosis can be founded on this part of the symptoms.

If, as I have stated, the specific nature of the inflammation cannot be positively ascertained from the changes in structure which take place during its progress, or from the sensations of the patient, it remains to be determined whether it can be ascertained by any other means. As I stated with respect to rheumatic inflammation of the eye so do I with respect to the arthritic, that it cannot be with certainty recognized as such unless there be unequivocal evidence of a gouty diathesis in the system, either from present symptoms or previous paroxysms. If a person advanced in life, who has lived freely, and suffers much from dyspepsia, with flatulence and sour eructations, irregular action of the bowels and liver, lithic deposits in the urine, and transient pains of joints or muscles, be attacked with severe inflammation of the eyeball, the practitioner will be justified in assuming that such inflammation is the effect of this state of the system: and if, in addition to this, there have been undoubted gouty paroxysms already, or unquestionable hereditary predis-

position, he may be still more satisfied as to the nature of the disease. He may even entertain doubts as to the inflammation having been actually caused by the seizure of the eye by the gout, and may attribute the mischief to exposure to cold, and yet still be bound to consider the attack arthritic; because there can be no doubt that simple idiopathic inflammation, and even inflammation from injury, is altered in character and rendered more unmanageable by the presence of this state of the system. I have more than once or twice found patients upon whom I had operated for cataract, almost unaccountably attacked by violent pain and inflammation several times during the six or twelve months following the operation, which I could only attribute to the effect of gout, which was evidently present in the system, although not concentrated on any joint. I have also observed that under similar circumstances, as well as after inflammation from injury, there was no relapse or recurrence of the mischief when the patient experienced periodical attacks of regular gout in the foot.

Although it is difficult, if not impossible, to distinguish inflammation of the eye, caused or modified by gout, from rheumatic or even simple idiopathic inflammation, by observation of the changes in structure which take place, or of the sensations of the patient, especially in advanced life, yet when this organ is attacked by gouty inflammation, symptoms not so commonly noticed generally present themselves, or are to be apprehended. The sclerotic vascularity is more intense, and, in aged persons at least, more of a livid, lurid, or venous complexion; the vessels being, I think, less distinct and more obscured by conjunctival vascularity: and the cornea is more liable to become gray at its circumference. The pupil, I believe, becomes more frequently fully dilated than contracted and adherent, owing either to the adhesive process not taking place, or

from the iris not coming into contact with the lens in consequence of its flatness in advanced life : or it may become completely dilated in consequence of the nerves being involved in the inflammation. From whatever cause it may arise, full dilatation of the pupil, especially at an early stage, is a bad symptom, and is generally followed by permanent loss of sight. I do not mean to intimate that contracted and adherent pupil does not take place in gouty inflammation, for it sometimes does, and hence the disease has been called a gouty iritis ; I only mean to state that dilatation is perhaps a more frequent occurrence. The yellowish or greenish opaline opacity of the lens which causes the appearance commonly called glaucoma appears also to take place more frequently from the gouty than from other forms of inflammation, yet I have seen common blue or milky cataract, both uniform and stellated, caused by this disease. The retina is always engaged, and vision therefore is either greatly impaired or altogether lost as long as the inflammation continues ; or it is permanently destroyed unless the progress of the disease be speedily arrested. The inflammation sometimes seems to attack the retina first, or, as is said, it commences with amaurotic symptoms. I have seen sudden loss of vision, unaccompanied by any visible appearance of inflammation, followed speedily by sclerotic vascularity, and other destructive consequences in a gentleman subject to paroxysms of regular gout. If, in addition to these symptoms, or any of them, there is evidence of the existence of the gouty diathesis in the system, or if the patient has already suffered from true gout, or even is liable to it from undoubted hereditary predisposition, the practitioner cannot be at a loss to form a diagnosis, and his prognosis should, I believe, be a very guarded one ; because the disease is not so much under the control of ordinary remedies, and is more destructive in its effects. Blindness,

dilated or adherent pupil, and opacities of the cornea or lens, or in other words, anaurosis, gutta serena, and cataract, are the more usual consequences, while complete recovery is less frequent. In all that I have been stating, however, with respect to this disease, I wish it to be understood that I offer my opinions with reserve, because I have not seen enough of it to enable me to write with greater confidence. Gout is not now, I believe, a very common disease in this country, and it seldom attacks the eye: when it does, I oftener see the patient after it has done all the mischief it is capable of than while it is within reach of treatment.

The treatment of gouty inflammation of the eye must of course be conducted in accordance with the general principles already laid down for the treatment of the other forms, with such modifications as the peculiar and specific nature of the constitutional disease demands. There may even perhaps be less departure from the usual course pursued in simple uncomplicated inflammation than might at first sight be supposed; because the eye is so seldom primarily attacked, and still seldomer is it the part upon which the local effects of a regular paroxysm of the disease is concentrated. It is more frequently one of the places of temporary seizure by irregular gout, or it is affected in consequence of metastasis or retrocession of the disease from its more usual seat; and therefore there is less danger of the consequences which sometimes result from the suppression of an attack of the foot or hand, should it be necessary to resort to vigorous and decisive measures for its removal. In fact, few, if any, of the resources at our disposal for the treatment of other forms of inflammation of the eye, are unavailable for this. Some there are which may be ineligible or objectionable as regards the general treatment of gout, but not so much so as entirely to forbid their application, if to be relied on to arrest the destructive

processes of inflammatory action in an important and delicately constructed organ. Bleeding, purgatives, nauseating and diaphoretic medicines, and mercury, although perhaps not always, if at all, to be relied on in the treatment of gout attacking other parts or of a different character, may and often must be resorted to when the disease attacks the eye. Colehium will probably be found even more valuable than in other species of inflammation, and bark and iodine in the advanced stages are not forbidden, although turpentine from its effects on the kidneys and bladder should perhaps be interdicted.

TREATMENT OF GOUTY INFLAMMATION.

With respect to bleeding, either general or local, in the treatment of inflammation of the eye, I have already expressed my opinion when considering the simple, uncomplicated, or idiopathic form, and again when treating of the syphilitic and rheumatic species: of its use in gouty inflammation much doubt must be entertained and caution exercised. Considering the objections made to general bleeding in the treatment of gout, and its doubtful value in rheumatic or even idiopathic inflammation of the eye in many cases, the practitioner will probably seldom be called on to resort to it in the true arthritic form of the disease. In a young and plethoric subject, and when the inflammation is intense and pain severe, general bleeding is not to be interdicted, and more especially is it not when we recollect that the attack may be from exposure to wet or cold, and only partaking of the gouty character from the existence of that diathesis or predisposition in the system. To the local abstraction of blood by leeching or cupping, less objection can be made. It will, as in rheumatic inflammation, probably abate inflammatory action, or perhaps

may lead to the shifting of the disease to its more ordinary locality. It is unnecessary to repeat what I have already stated as to the place or method of application.

Purgatives may be relied on in arthritic inflammation of the eye, as in the rheumatic, more from their operation in discharging from the system deleterious ingredients by secretion from the mucous membrane or liver, than from their effect in merely removing the contents of the intestine and interrupting nutrition. They may therefore be used more freely than in common idiopathic inflammation, but not to the extent of causing continued irritation of the bowels, or too profuse a discharge; perhaps the common combination of calomel or blue pill, with the compound colocynth pill, and some extract of hyosciamus, as suggested in rheumatic inflammation, may answer every purpose; with the occasional addition of such saline and antacid medicine as circumstances and symptoms may suggest. Purgatives of the latter class should, however, be rendered more grateful to the stomach by the addition of some warm aromatic tincture.

The kidneys and skin should be put into requisition, as well as the mucous membrane of the intestines and liver, to secure the extrication of accumulated acid or other pernicious ingredients in the system. Presuming the existence of such may be considered a theoretical assumption, but the presence of lithates in the urine, and an acid state of the perspiration, afford strong arguments in favour of such an inference. The practitioner may not, perhaps, be called upon to go the length of administering positive diuretics, but the free use of simple diluents will be advisable; and diaphoretics may be resorted to not only with safety but advantage. I have already, in treating of simple inflammation of the eyeball, as well as that modified by rheumatism, alluded to the use of antimonial medicines, and it is therefore unnecessary to enlarge on

the subject here. It is only necessary to add, that unless forbidden by great irritability of the stomach, they may be used as freely as in other forms of inflammation; and even should they cause nausea, they may be continued in smaller and more frequent doses. If it be probable that the attack cannot be arrested without resorting to mereury, the antimonial medicine may be combined with it, as I have directed in treating of simple idiopathic inflammation, and may be omitted as soon as it is found that the latter remedy must be pushed to its usual effects.

Whatever opinion may be entertained respecting the use of mereury in the treatment of gout attacking other parts, it must, I think, be admitted, that it cannot be dispensed with where an organ so delicate and so liable to injury from inflammation as the eye is the seat of the disease. Its influence in arresting inflammatory action is too well established to justify our refraining from its use, even should it be considered ineligible on general principles, and the uncertainty as to the disease being really of true gouty character forbids our temporizing. So much, however, has already been stated with respect to the method of administering this remedy, that little remains to be added here. After the bowels have been emptied by the combination of the blue pill or calomel, with the compound colocynth pill, followed by a dose of the common mixture of infusion and tincture of senna with Epsom salts, the blue pill may be continued in repeated and smaller doses, with or without the addition of the purgative pill, according to its effect on the bowels, and until the benefit to be expected from copious discharges in this way shall have been secured. After that the blue pill may be continued in combination with tartrate of antimony, as suggested in the rheumatic form of disease; and finally it, or calomel if preferred, or the *hydrargyrum cum creta*, with or without Dover's powder, or opium, as

the state of the bowels requires, is to be persevered in until the mercurial effect is produced.

Of the other remedies enumerated in treating of these inflammations of the eye, such as turpentine, bark, sarsaparilla, guaiacum, and iodine, it is not necessary again to dwell. The extent to which they should be relied on, and the circumstances under which they are to be employed, have been fully discussed, especially in considering the rheumatic species. Turpentine, as I have already said, the practitioner can scarcely venture to employ in the gouty inflammation, or even where the inflammation takes place in a subject of gouty constitution, from its effects on the urinary organs and the tendency of the disease to settle sometimes there: the others come into requisition in the more advanced or chronic stages of the disease only, or when it proves refractory, or is unchecked by other means. Colchicum, however, being a remedy admitted on all hands to exercise, sometimes at least, a peculiar or specific influence on gouty inflammation, or on the system at large under the influence of the gouty diathesis, its effects on inflammation of the eye caused or modified by this disease, demand further consideration.

We are not, I presume, called upon to reject colchicum as a remedy in inflammation of the eye, or even to repose less confidence in it, because we may not be able to explain clearly how it operates. We do not reject mercury, turpentine, iodine, or bark, for any such reason, and we must therefore be satisfied to accept this under similar doubts, if we be satisfied from experience and evidence that it really exercises a beneficial influence. At the same time, whatever trust may be reposed in it for the treatment of gout generally, no one would, I believe, be justified in relying upon it alone to arrest a severe attack of gouty inflammation of the eye. It is when we entertain doubts respecting the safety or efficacy of depletion.

mercury, or antimonials; or when these have failed to produce their usual salutary effects, that we are called on to resort to this and other remedies of similar character. Assuming that its beneficial operation depends upon the impregnation of the system with the active principle upon which its influence depends, it should be administered at first cautiously, and continued with careful observation of its effects until it has had a fair trial. Instead of combining it with purgatives, as is sometimes practised, it should be reserved until the bowels have been emptied by other means: giving it to the extent of causing nausea or purging will probably interrupt its absorption, and thus prevent its exercising its peculiar or specific influence on the constitution. From its depressing effect it does not appear suited to the treatment of cases which frequently relapse or recur in aged persons of feeble frame. I prefer giving colchicum alone to combining it with other remedies, because it is in this way only that I can observe its effects accurately, and decide with confidence on the expediency of persevering in its use or discontinuing it. That it may be given in combination with alkalies with advantage, where such are required, I do not deny; but the indiscriminate addition of such an agent is not to be permitted. If the urine exhibits unusual acidity, with copious precipitate of lithates, and especially if there be at the same time heart-burn or sour eructations, ten grains of bicarbonate of potass may be added to each dose, until this defect of gastric and renal function shall be corrected; but after this object shall have been attained, it obviously should not be continued. The addition of a small quantity of aromatic tincture may be permitted, and even a few drops of tincture of opium may be necessary, if it causes nausea or purging. Twenty drops of the *vinum radice colchici* may be given three times a day, or every six hours; and this should be gradually increased to half a drachm or more, if

it does not affect the stomach or bowels. The practitioner will of course adopt the necessary precautions to secure a safe and genuine preparation of the remedy, and he will derive advantage from consulting Mr. Donovan's communication on this head, published in the 15th volume of the *MEDICAL PRESS*, p. 182.

Should it be necessary to resort to bark or quinine, or to iodine or guaiacum, in consequence of the inflammation lingering or becoming refractory or chronic, they may be administered as I have suggested in treating of their use in rheumatic inflammation; and at the same time the state of the system, considered to be the consequence of the gouty diathesis, should be corrected. Not only this inflammation, when it has once taken place, but the rheumatic, and even the idiopathic or simple uncomplicated forms, are liable to recur for a considerable length of time after the first attack; often once or twice a year for several years: and although this is probably owing in a great degree to the enlarged or relaxed state of the vessels of the eye caused by the preceding inflammatory action being more easily influenced by exposure to wet or cold, it must be owing to constitutional disturbance also. Such patients should therefore be subjected to regular discipline as to diet, bodily exercise, and general habits, and should be carefully watched to prevent interruption of the functions of the liver or kidneys, or to correct defective states of the stomach and bowels. In other words, every precaution and corrective should be resorted to in order to remove the gouty diathesis, if present, or to prevent its establishment, if approaching, or to be apprehended from hereditary predisposition; and similar precautions should be adopted to prevent relapse or recurrence of rheumatic inflammation. A detailed enumeration of the resources at the disposal of the practitioner to effect these objects would be misplaced here; they exist in the treatises on

gout and rheumatism, and may be found in a condensed and methodical form in Dr. Todd's Croonian Lectures on Gout and Rheumatism,—a convenient, rational, and trustworthy introduction to the study of these complicated and often unmanageable diseases.

Respecting local applications in inflammation of the eye, I have given my opinion so much at large in treating of the simple or idiopathic form, and again more briefly in alluding to their use in the rheumatic species, that it is unnecessary here to enlarge on the subject. If there be no severe pain, the eye should be left uncovered, and no interference with it by lotions or stupes permitted; but if there be a distressing aching or burning sensation, with feel of tension, and still more, if there be, as there often is, agonizing torture, sedative and soothing applications must have a trial. Strong infusion of poppy heads, with some extract of belladonna, may be used as a stupe for some time, and then continued as a tepid lotion, with a single fold of old linen under a bit of oiled silk, until the pain abates, or until the application is found of no avail. A thick painting of good extract of belladonna, once or twice in the twenty-four hours, should, under similar circumstances, be made over the brow and lids. Considering the migratory nature of gout, and admitting the fact of its translation from one part to another, either spontaneously or in consequence of applications to the suffering part, blisters may be considered worthy of trial, and little apprehension need perhaps be entertained that if they have such an effect the disease will be transferred to any more important organ, as sometimes happens when it is repelled from the foot. When the eye is really the seat of gouty inflammation, it is attacked rather incidentally or in a secondary way, than primarily, or as the place of concentration of a regular paroxysm of the disease. The blister may be applied to the temple first, and

afterwards behind the ear, and not kept open but repeated, as it is not continued irritation so much as temporary cutaneous inflammation that is required.

Immersion of the feet in warm water for some time is resorted to in all forms of inflammation of the eye from a theoretical conviction that by so doing the inflammatory action may by such means be diverted from the part it occupies, and attracted to that thus stimulated. How far the practice may be justified by the inference cannot be discussed here, and we must therefore be guided by experience as to the value of the remedy. That it is not always, or perhaps even very often, followed by well-marked beneficial results, must, I believe, be admitted; but on the other hand, it must, I think, be admitted that it has not been attended with any mischievous consequences. I have myself generally employed it, and placed reliance on it, without having reason to regret it. In gouty and rheumatic inflammation especially it is indicated, and in these forms I have used it freely. To increase the effect stimulating ingredients are added to the warm water, and on principle at least the practice appears entitled to consideration. A handful of ground mustard with some scraped horse-radish is generally employed, and answers the purpose of cutaneous stimulation as well as any other: the quantity of either ingredient does not seem to be accurately determined, owing, perhaps, to the difference in the purity of the mustard, or in consequence of the skin being more delicate in one person than another: it may, however, be increased or diminished according to the effect. I have used the hot mustard bath to the hand both in gouty and rheumatic inflammation of the eye, and I think with benefit. The application of a sinapism over the first joint of the great toe, or over any other joint which had been the seat of the disease on a previous occasion, may also be made with a fair prospect of advantage.

ON SCROFULOUS INFLAMMATION OF THE EYE.

THAT the eyeball is sometimes the seat of a species of inflammation justly entitled to the denomination of scrofulous, from its symptoms and results, will not, I believe, be denied, but how far that inflammation is an immediate consequence of general constitutional derangement, or a concentration of a specific disease pervading the entire system, may not be so freely admitted. It may be assumed that the inflammation is not so much a local outbreak of scrofula as an inflammation caused by exposure to cold, and modified by that disease: the distinction is, however, not perhaps practically of importance, because in either case the peculiarity of the affection arises from its specific character. But while it cannot be denied that the eyeball is sometimes the seat of scrofulous disease, it may at the same time be doubted whether it is so frequently attacked by it as is generally supposed; for in many cases assumed to be of this nature, there is really no evidence of the existence of any such malady, either in the system at large or in the part affected. When treating of rheumatic and gouty inflammation of the eye it was necessary to enter at length into an inquiry as to the occurrence of such species of disease of the organ in any case; and assuming that to be established, it became necessary to consider how far the visible changes in the parts affected afforded conclusive evidence as to the fact. In treating of scrofulous inflammation of the eye, it becomes equally necessary to inquire whether the appearances are so peculiar as to justify the practitioner in pronouncing the disease to be of this peculiar specific

character; or in other words, whether he can form a correct diagnosis from the changes in vascularity, diminution of transparency, or alteration in colour of the structures engaged. The common practice of assuming that certain forms of inflammation of the eyeball and conjunctiva are serofulous, because the patient does not appear to be in a vigorous state of health, or because the disease does not yield to depletion or other usual remedies, leads to erroneous views and unsuccessful practice, and should be abandoned. No inflammation of the eye should be pronounced serofulous unless the local disease or the constitutional peculiarities fully justify it, and it therefore becomes necessary to consider carefully what are the characteristic symptoms.

If a person of delicate frame, with fair skin, light hair, and blue eyes, be attacked with iritis or other form of internal inflammation of the eye, it is often assumed that such inflammation is either the immediate consequence of serofula pervading the system, or at least that if it has been induced by exposure to wet or cold, it is so modified by the constitutional disease that it should be considered serofulous. It seems even sometimes to be supposed that the disease is the local manifestation of a malady affecting the entire frame, a concentration of the specific poison, if it may be so called, necessarily accompanied by inflammatory action. This assumption is, however, far from being justified by experience and careful observation. It remains, I believe, after all, to be proved that persons of fair skin, light hair, and blue eyes, are more prone to serofula in any form than those of a different complexion, and I am convinced that true serofulous disease affecting the eye is not more frequently found to occur in such subjects. On the contrary, indeed, true serofulous disease of the eyeball probably occurs more frequently in persons of dark coarse skin, black hair, and deep brown iris. The

practitioner must therefore form his opinion as to the character of the inflammation from some more certain indications. His object should be to determine how far his treatment is to be modified in consequence of constitutional diathesis, and to attain this object he should first ascertain with certainty whether any specific constitutional diathesis be present or not. To establish the fact of the existence of scrofulous disease in the constitution with this view, it may not be necessary to have evidence of the presence of scrofulous tubercle, or other conclusive proof of the active progress of the malady; but there should be some more characteristic marks of it than those afforded by the tint of the skin or the general formation of the body. A thick upper lip, brawny prominent cheeks, and tumid nose, accompanied by coarse, greasy, and dingy discoloured skin, will, when present, enable the practitioner to form a safe estimate of the state of the constitution; and if cutaneous excoriations at the angles of the mouth and margins of the nostrils, as well as at the edges of the eyelids and about the ears, be also present, and causing enlargement of lymphatic glands beneath the chin and angles of the jaws, little doubt need remain of at least a predisposition to the specific malady. I have also to remark that although I have denied that a fair skin and light hair necessarily indicate a scrofulous constitution, it must be admitted that extreme transparent delicacy of the cutaneous surface permitting the subjacent blue veins to appear ramifying beneath it, and displaying a florid brilliancy of colour of the cheeks and lips, is evidence, if not of that diseased state of the system, at least of a very feeble state of constitution, entailing great liability to destructive local inflammatory action. To enlarge on this subject would, however, be to write a treatise on scrofula, and I must therefore leave it to the practitioner to determine from his own resources how far constitutional symp-

toms justify him in modifying his treatment in each particular case which comes under his care. He has to be on his guard against pronouncing the disease to be serofulous on insufficient grounds, while at the same time he has to guard against the risk of treating it as a simple uncomplicated attack, although truly specific in its nature.

In endeavouring to determine correctly the state of constitutional or local disease justly entitled to be considered serofulous, and to restrict the term to such state, care should be taken that we do not lose sight of the real object aimed at in our attempts to secure accuracy of nomenclature and arrangement: that we do not, in other words, overlook facts because we differ as to terms. Many who pronounce an inflammation of the eye to be serofulous, probably do not thereby mean to assert that there is serofulous deposit in the lymphatic glands, or any other form of local disorganization or constitutional condition undoubtedly of this nature; they probably mean only to intimate that the inflammation is of peculiar character because the subject of it presents certain appearances of defective bodily health. The meaning intended to be conveyed perhaps is, that the inflammation will pursue a protracted and destructive course, because the powers of assimilation and growth are weak, the circulation feeble, and consequently the entire frame destitute of vigour. Of the correctness of such an inference there can be no doubt, and it therefore does not matter much as to the terms used in arriving at it. Deposition of fat instead of growth of muscle, pallid skin, and feeble circulation, in consequence of ill-assorted or deficient food and defective respiration, are indications of a state of constitution calculated to modify the local inflammation as much as any positive proofs of the existence of specific serofulous disease. This state of the system, so often assumed to be serofulous, is of such frequent occurrence, and is so often the forerunner or

cause of the development of real serofula, that its identification with that disease need not cause surprise, and the practitioner, in adjusting his treatment, may with safety resort to the same measures in the one case that he employs in the other.

Whatever difference of opinion may exist with respect to the state of constitution entitled in strictness to the denomination of scrofulous, it is important to determine what are the peculiar symptoms and effects observed in inflammation of the eye caused or modified by that disease. With this view the practitioner should observe whether or not any one part of the organ is more engaged than another: whether the inflammatory action is intense and acute, or slow and languid; and whether the changes in organization are slight and of ordinary character, or considerable and unusual. I am of opinion that in persons either of scrofulous habit or of feeble frame, the parts most frequently engaged, and which suffer most, are those situated most anteriorly; such as the cornea, membrane of the aqueous humour and iris. In other words, I believe that true circumscribed corneitis, and inflammation of the lining membrane of the chambers of the aqueous humour, causing adhesions of the margin of the pupil to the capsule of the crystalline lens, are more frequently caused or modified by this state of the system. The retina, it is true, is not unfrequently attacked by slow, destructive, and insidious inflammation under similar circumstances; but general and severe inflammation involving the entire organ is oftener of a simple idiopathic or of a rheumatic or syphilitic character. Any form of inflammation of the eye may be modified by a serofulous diathesis, but these insulated affections appear to be more frequently so influenced than others. The sclerotic also appears to give way more frequently from protracted inflammation, and to permit the choroid to project in the form of black prominent

tumours in persons of serofulous constitution or debilitated system. It remains, however, to be determined whether true serofulous inflammation presents any peculiarity of appearance or change which will enable the practitioner to pronounce a confident opinion as to the nature of the disease.

The remarkable increase in red vascularity of the sclerotic which accompanies all other inflammations of the eyeball, is present in the serofulous form also. In the more transient and languid attacks which appear confined in a great degree to the membrane lining the chambers of the aqueous humour, and which disappear after causing adhesions of the margin of the pupil to the capsule of the crystalline lens, this vascularity is very slight, often indeed scarcely to be perceived; but in more severe attacks, and where the iris, or the cornea, or both, are engaged, the characteristic sclerotic vascularity is displayed as conspicuously as in any other species. The redness, however, is in general somewhat different from that observed in simple uncomplicated inflammation of the eyeball occurring in a healthy subject. The colour has less of the florid arterial tint and more of the purple shade, derived from venous turgescence; and it is also more uniform and diffused than confined to distinct vessels converging to the circumference, as in syphilitic iritis and other varieties. It sometimes also, especially where the cornea is particularly engaged, commences in a patch or circumscribed spot at one side, which is followed by a similar one at the opposite, and ultimately by general redness of the entire membrane. This is, I think, a remarkable character of the disease, and therefore when such insulated inflammatory vascularity is observed at the commencement the practitioner has reason to expect a form of disease less likely to yield to usual plans of treatment.

The cornea in scrofulous inflammation of the eye is, I think, more frequently engaged in the disease than in other forms or varieties. Insulated inflammation of the cornea, the true *corneitis* of writers on diseases of the eye, takes place generally in persons exhibiting marks of scrofulous constitution, or at least of such languor or debility of the frame as is equivalent to such a state; but as I propose hereafter to consider this form of disease in detail, I will not dwell on it here. What I have now to observe respecting the state of the cornea in true scrofulous inflammation of the eyeball is, as I have said, its being more implicated than in simple idiopathic, syphilitic, or even rheumatic inflammation. It is not the gray margin described as frequently found bounding the circumference in inflammation of the eye in advanced life, and considered to be characteristic of the rheumatic or gouty species, that is to be observed in scrofulous inflammation, but a general haziness or milky hue, and a remarkable roughness or loss of polish on the surface of the conjunctival layer, or a slight loss of transparency, having more of a yellowish tint, as if some very slight effusion had taken place in the structure of the part. Very deep-seated small white opacities, generally in or near the centre, are also sometimes to be seen. The consequences of these attacks often prove that the disease has extended to the cornea, that part of the organ often losing its correct curvature in protracted and unmanageable cases, or becoming prominent or conical in common with the anterior portion of the sclerotic, or separately. It also, in cases of long duration, is pervaded by vessels carrying red blood, and becomes permanently opaque.

In scrofulous inflammation of the eye, or in simple idiopathic or other inflammation modified by a scrofulous diathesis, or by an inactive or languid state of the functions of circulation and nutrition, the membrane lining

the chambers of the aqueous humour is as much affected as in the most acute attacks in healthy and robust subjects. This is displayed by a muddy or hazy appearance of the cornea, caused by opacity of this membrane, where it covers or lines its posterior surface, as well as by the adhesions which form between the margin of the pupil and the capsule of the crystalline lens. This diffused muddy or hazy appearance which so frequently presents itself in syphilitic, and sometimes in simple idiopathic inflammation, does not perhaps occur so frequently in the serofulous form, but it sometimes does occur and is easily recognized. When the cornea is much engaged, an opacity sometimes exists on its posterior surface, in the shape of a small distinct white circumscribed spot; but this may be in the elastic layer of this part, or in its proper structure. The mottled opacity which remains in the shape of delicate specks on the back of the cornea after the inflammation subsides, and which I have particularly noticed in describing the symptoms of idiopathic and syphilitic inflammation, often remains after serofulous inflammation also. Adhesions of the margin of the pupil to the capsule of the crystalline lens take place very generally in serofulous inflammation, as well as in inflammation modified by a feeble or languid state of the system; and sometimes in consequence of very slight and transient attacks. I am often surprised to see the strong and extensive adhesions which are found in the eyes of females of feeble constitution at an early period of life, who, when questioned on the subject, declare that they never had any pain or redness of the eye, notwithstanding this unequivocal proof of inflammation having occurred, and notwithstanding the defect of vision which accompanies this state of parts. I do not think I have seen hypopion, or effusion of purulent matter into the aqueous humour, in serofulous inflam-

mation; the nature of the disease does not, however, render such an occurrence improbable.

The iris in this, as in all other forms of inflammation of the eyeball, is particularly affected, and the changes in colour, as well as the contraction and adhesions of the pupil, are as conspicuous as in the species already fully described. It is, however, I believe, in scrofulous inflammation alone that deposits resembling those which take place in syphilitic iritis, commonly assumed to be coagulable lymph, take place; but in scrofulous inflammation the deposition, when it occurs, is not of the same nature as in the syphilitic disease. It is, in fact, of the nature of true tubercular matter, and instead of being absorbed, as the matter is in syphilitic iritis, it increases in bulk, and either bursts as an abscess externally, or sometimes, but very rarely, into the aqueous humour. This I consider to be the most characteristic and unequivocal proof of the scrofulous nature of the disease, and so much so, that I consider all the other changes in structure above enumerated to be but corroborative evidence of its specific nature, taken in connexion with constitutional symptoms. The tubercular deposition here alluded to generally takes place towards the circumference of the iris near its junction with the ciliary ligament, and consequently under the margin of the cornea. It is at first a small yellow irregular mass with red vessels passing over it, as in the deposits in syphilitic iritis, but it gradually enlarges and extends under the margin of the cornea beneath the sclerotic, which gives way before it, and allows a prominent yellow mass to project beneath the conjunctiva. This continues to enlarge, and assumes the appearance of an abscess; and in some cases becomes so prominent and irregular in form, is so enveloped in large and tortuous vessels, and presents so peculiar an appearance from the dark choroid coat, appearing through

the thinned sclerotic around it, that it has sometimes been supposed to be of malignant character, so much does it resemble fungus hæmatodes. Attention to the history of the case, independent of obvious difference in appearance and structure will, however, generally prevent any such mistake from being made. This state of disease has not escaped the observation either of Dr. Mackenzie or Mr. Lawrence, although they both direct attention to it more with a view to prevent its being confounded with fungus hæmatodes than to treat of it as a consequence of serofulous inflammation of the eyeball. Dr. Mackenzie, in alluding to "Non-malignant Tumours of the Eyeball," observes that "he thinks it extremely probable that serofulous tubercles, exactly similar to those frequently met with imbedded in the cerebrum of children dying hydrocephalic, form upon or within the eye; for instance, in the substance of the sclerotica, iris, or choroid: and that such tumours lying deep in the eyeball will, with much difficulty, be distinguished from fungus hæmatodes;" and again, that "he had seen several cases of albuminous or serofulous tumours originating from the sclerotica, sometimes single, sometimes in clusters, soft in some cases, and firm in others, but with little or no vascularity; the subjects of such affections being always cachectic children, and the affected eyes having generally suffered from internal serofulous ophthalmia before the appearance of the tumours." Several of the patients, he states, died of chronic disease of the lungs. He also gives the following examples:—"A young lady about twelve had a serofulous tubercle attached to the upper part of the sclerotica; the eye had suffered much from serofulous internal inflammation; the tubercle was of a yellow colour; it slowly enlarged to the size of an almond, and seemed in a state of suppuration, but did not actually suppurate. The general health was much impaired, and the patient died

soon after." In another girl, a cluster of scrofulous tubercles presented on the lower half of the sclerotica close to the cornea. The vision of the eye being dim, the cornea hazy, and the pupil dragged towards the side of the eye on which the tumours were situated. In another, a girl, aged nineteen, "the eye had been considerably inflamed for about five weeks, with considerable pain in it, as well as in the circumorbital region. The conjunctiva and sclerotica were injected with blood, the cornea slightly nebulous, the iris somewhat changed in colour, vision very imperfect, and the motions of the pupil sluggish. At the bottom of the anterior chamber there was a yellowish mass, having much the appearance of pus, with reddish streaks, as if from bloodvessels passing over its surface. This yellowish substance gradually increased in size, and assumed the appearance of a scrofulous tubercle. It caused an elongation of the cornea downward, so that the cornea had an oval shape. The tumour diminished considerably, and the inflammatory symptoms subsided, under the internal use of mercury, quina, and belladonna. The patient was now seized with insomnia, spectral illusions, delirium, and loss of motion of the right arm, and died, but the body was not examined." Mr. Lawrence, under the head of "Diseases in which fungoid or other growths, not of malignant character, take place from the anterior part of the Eye," relates the following case:—"A child, six years old, came to the London Ophthalmic Infirmary, with serious external inflammation of the eye, attended with so much swelling of the palpebræ that the exact state of the globe could not be ascertained. Subsequently on obtaining a view of the eye, vivid external redness, with a dull state of the cornea, was observed, and the iris was found pushed forward, and the pupil partially opaque. A tumour gradually arose behind the edge of the cornea; it was of a yellowish colour, and acquired the size of a

horse-bean. Subsequently two or three other projections took place of smaller size arranged with the first in a regular series, at a short distance from the margin of the cornea. The inflammation continued severe, although leeches and aperients had been frequently used. When several weeks had elapsed, the inflammation abated, the pain became less, and the protuberances round the cornea diminished in size. At last the latter completely shrunk, the eye became atrophic, and the child recovered without any other ill consequences."

This was, I think, a case of true scrofulous inflammation of the eye, and the tumour "which arose behind the edge of the cornea, of a yellowish colour;" and which "acquired the size of a horse-bean," was, I believe, composed of tubercular matter. In Mr. Tyrrell's work on Diseases of the Eye, (p. 310, vol. i.) the following case is recorded as an illustration of his observations on "Inflammation of the Aqueous Membrane, with Deposition of Fibrine." It is evidently another example of the same species of disease. The patient was a "female of stout make, though feeble power, having light complexion and blue irides," and been treated for rheumatism by depletion, low diet, mercury, and colchicum. There existed "a large patch of a dull purple colour at the nasal side of the cornea, and this resulted from numerous vessels of the sclerotic, which were filled with dark blood; and over these a few of the conjunctival vessels also, distended with coloured blood, could be distinguished." This was the circumscribed or insulated sclerotic vascularity which I have alluded to as taking place more frequently in scrofulous inflammation. "The globe was tender to the touch. She had a dull aching pain in it, and also on the cheek and forehead, and these pains became much aggravated at night." This was treated by tonics and nutritious diet, but the patient having caught cold, "the anterior chamber became slightly

cloudy, from a low morbid action attacking the entire aqueous membrane ; and besides the slight general thickening of this tunic, its surface became spotted by small tubercles of fibrine. The majority of these tubercles formed in connexion with the corneal part of the membrane; and a few appeared on the iritic portion: one tubercle in particular on this part of the aqueous capsule acquired a size equal to a partridge shot." After three months' treatment by tonics, generous diet, and mercury in small quantity, the disease was removed.

Dr. Farre, in a communication made to Mr. Travers, and published in the latter gentleman's essay on Iritis, contained in the first part of the essays published by him and Sir Astley Cooper, gives the following description of a case of this kind :—The patient was a delicate female, aged about 25, and had been severely salivated for cutaneous eruptions, nodes of the tibia, and ulcers of the tonsils, but as the mercurial action declined, the eye became inflamed, and "lymph was deposited on the iris and became organized." For this she again took mercury, and the iritis was subdued, but after the mercurial action subsided, "the inflammation of the internal tunics of the eye returned with an extent and duration of suffering rarely exceeded. The disorganization was progressive, the anterior and posterior chambers were filled with lymph, and all sensibility of the retina was lost. In one week from the recommencement of the inflammation the disorganization of the eye was completed. From the general appearance of the sclerotic coat, and a distinct pointing at one part of it, joined to the excess of coagulable lymph in the anterior chamber, it seemed to me, that contrary to my former experience, the iritis had terminated in suppuration." An opening was made into the posterior chamber of the aqueous humour, but no discharge of pus followed, and the eye was ultimately destroyed. This

was, I think, one of these cases of serofulous deposition in the iris extending beneath the sclerotic, the effused material being more of the nature of tubercular matter than coagulable lymph, and obviously not presenting any of the characters of pus. Mr. Travers himself, in the same work, relates the case of another young woman, aged 24, who had been treated with mercury for pains affecting the head and calves of the legs, and who had subsequently sore throat and "a rising upon the tibia." Her eye was attacked by inflammation a short time afterwards. "The pupil was contracted, irregular, and a *very large mass* of brown lymph covered the semi-diameter of the iris next the temple, projecting so as to occupy more than one-third of the aqueous chamber; the cornea and humours being hazy. The sclerotic conjunctiva had a leaden colour, and the eyeball appeared to have lost its spheroidal shape, as from interstitial absorption of the vitreous humour." After local bleeding by leeches and cupping, and a course of corrosive sublimate with hyoseianus carried on to ptyalism, the eye was "surprisingly restored." Although the swelling on the tibia suppurated, doubts were entertained as to the syphilitic nature of the disease. In Mr. Saunders's treatise on Diseases of the Eye, a faithful representation is given of this projection of the sclerotic from deposit beneath it in severe inflammation of the eyeball, bearing a close resemblance to a pointing abscess. Mr. Hewson, in his observations on venereal ophthalmia, gives the following account of the form of disease to which I have been directing attention:—"I have had an opportunity of seeing a few cases of some years' standing, in which, from ignorance of their nature, no proper treatment had at any period of the disease been employed; in these there was no appearance of inflammation, nor was any uneasiness experienced; the aqueous humour had regained its natural transparency; and there

was only to be seen the contracted and adherent pupil, the opaque capsule, and two or three enlarged varicose vessels, like veins, running through the substance of the sclerotic. About this latter period, or after the disease has for some time established itself in the eye, and where an irregular and inefficient treatment has been pursued, an abscess sometimes forms in the deeper-seated parts, which generally terminates in the destruction of the organ. The first symptoms which indicate a tendency to this (as happened in a few cases that fell under my observation,) are some degree of œdema and swelling on the forepart, and on one side of the eyeball, immediately behind the ciliary attachment of the iris. At this place, a distinct tumour soon forms, which in a few days becomes pointed, and white and soft at the apex; when opened, the matter it contains oozes but slowly from the orifice, and will be found darker in colour, and more thick and tenacious in consistence than common pus. While the abscess is thus making its way externally, we shall at the same time observe it pointing towards the anterior chamber. A contiguous portion of the iris is protruded forwards, so as to come nearly in contact with the cornea: this soon gives way; and the same kind of tenacious matter which appears at the external opening is seen deposited in flakes into the anterior chamber, *but does not subside in, or mix with, the aqueous humour*, as happens in common hypopion. Both iris and cornea are quickly destroyed by sloughing and ulceration, the aqueous humour, lens, and a part of the vitreous humour, are evacuated, the sclerotic contracts about the vacant space, and finally the anterior chamber is obliterated."

It may be argued that the form of disease which has been alluded to by the authors above quoted is truly syphilitic, and that there are not sufficient grounds for assuming that it is of serofulous nature; but when it is

recollected that it is an unusual consequence of syphilitic iritis, and that it takes place in scrofulous subjects in whom no syphilitic disease ever existed, the objection becomes less applicable. It is also to be recollected that an inflammation which commences as syphilitic may become scrofulous in consequence of the prevalence of that disease in the system, or it may from the beginning be modified by the scrofulous diathesis, and thus influenced in its progress by the presence of two constitutional diseases. It even sometimes happens that the practitioner has to encounter the influence of syphilis, scrofula, and rheumatism, in the treatment of inflammation of the eyeball, and finds it to be one very difficult to resist or correct.

In my own practice, I have so often met with cases similar to those here quoted in persons of scrofulous constitution, and even suffering from glandular disease of that character, that I think there can be no doubt as to the nature of the malady. In one, an unmarried lady of about twenty years of age, the whole eyeball became filled with a firm yellowish mass presenting all the appearance of scrofulous tubercle, and suppurating at several points; so that I could pass a probe in different directions, nearly from one side to the other. The contents gradually crumbled down, and escaped with purulent discharge, leaving ultimately a shrunk and retracted sclerotic in the bottom of the orbit, and so little of any other morbid condition that she was able to wear an artificial eye without any uneasiness. I have now before me a drawing of an eye of an unhealthy girl of eight or ten years of age, in which a yellow tubercle, the size of a small pea, formed in the iris during inflammation, and burst near the margin of the pupil, allowing the contents to project into the aqueous humour, in which, however, it was not dissolved, but remained in a solid state until it was ultimately absorbed.

Of the influence of serofulous constitution in causing or modifying inflammatory conditions of the choroid or retina, I do not treat here, because I propose hereafter to allude to the subject when considering the insulated inflammation of these structures, known as corneitis, choroiditis, and retinitis. Neither do I allude to the inflammation of the conjunctiva, or rather its consequences, commonly called serofulous ophthalmia, until I come to consider conjunctival inflammation generally.

TREATMENT OF SCROFULOUS INFLAMMATION OF THE EYEBALL.

IN providing for the treatment of an attack of inflammation of the eyeball in a truly serofulous subject, the practitioner has to consider carefully the probable effect of the remedies he employs in ordinary cases when he comes to apply them to this form of disease. When alluding to the treatment of simple, uncomplicated, or idiopathic inflammation of the eyeball, I suggested the necessity of reconsidering the opinions generally entertained respecting the beneficial influence of depletion; in treating of inflammation modified by a serofulous diathesis, or even by that languid or defective condition of the nutritive functions which is often assumed to be serofulous, or perhaps equivalent to it, I have here to suggest a similar or even a greater degree of caution. A patient presenting all the constitutional marks of serofula, but otherwise in vigorous health, may be, and often is, benefited by local or even sometimes by general bleeding, but such a subject may also suffer from it, if it has not the effect of arresting the inflammatory action. The sudden abstraction of blood by weakening the heart's action and diminishing the activity of the capillary circulation will often cause local inflammation to abate or even to cease altogether; but if it has

not this effect it often contributes to produce that state of the system which leads to the effusion or deposition of serum, pus, or lymph, or even of the peculiar material called tubercular; and more frequently in serofulous than healthy subjects. In such subjects also bleeding appears to have less effect in causing the inflammation to abate or cease than in those not so affected, and this is, I think, especially to be observed when bleeding is resorted to after the inflammation has existed for some time and has been thoroughly established. Bleeding should therefore, if resorted to at all in this form of inflammation of the eye, be resorted to at the earliest period, and with the view of suddenly weakening the heart's action, and thereby diminishing the activity of the capillaries rather than for the purpose of suspending nutrition, or interrupting the salutary and ordinary functions of the circulating organs. The local abstraction of blood by leeches or cupping, be its effect on the disease what it may, probably exercises less prejudicial influence on the constitution than general bleeding, and may therefore be adopted with less risk of bad consequences; but in neither form is this resource, according to my experience, to be relied on to arrest inflammation in serofulous as in healthy constitutions.

The practice so generally pursued of suspending the processes of growth and nutrition by denial of the usual quantity of food of proper quality, to arrest inflammatory action, also requires reconsideration when it comes to be applied in serofulous subjects more particularly. It should be recollected that persons cannot continue to live without a renewal of the blood circulating in their vessels; and it is obvious that such renewal can be effected only by the administration of food capable of affording such blood. A sufficient supply of the ingredients necessary to sustain life is also required to maintain a healthy state of the system, and without such healthy state of the system

inflammatory action cannot be controlled or prevented from proceeding to the extent of effecting destructive changes of organization. Acting on these principles the practitioner should not, in scrofulous subjects at least, interdict for any length of time the use of nutritious food in sufficient quantity to supply the incessant expenditure of its elements by secretion and excretion. I do not mean to say that either in quantity or quality the diet should be as generous as in a state of health, but the sudden and total discontinuance of animal and vegetable materials necessary to sustain life or preserve health, and the substitution of those incapable of doing so, such as are commonly called slops, should not be permitted. The peculiar character of inflammation in scrofulous subjects is its not yielding in a short time, or in a distinct way, either spontaneously or to remedies, but rather gradually diminishing in intensity or becoming less active; in other words, not terminating so often in what is called resolution, but becoming chronic: we should therefore be prepared to encounter a protracted state of disease and to provide for its consequences by sustaining the strength and health of the patient. With this view animal food should not be interdicted, as it generally is, from a prevalent belief that it induces a predisposition to inflammation, or when it takes place exasperates it. Animal food should not be given, especially at the commencement, in such quantity as to risk even a temporary increase in the quantity of the circulating fluids, and thereby to induce increased action of the heart and corresponding activity of the capillary currents; in other words, the patient should not be allowed to make what is called a hearty meal, but he should have as much nutritious food as will secure the supply of the necessary quantity of blood of good quality to his system. Sudden and extensive change of diet should be avoided for another reason. The stomach

and alimentary canal may have their ordinary functions disturbed or interrupted by the discontinuance of the usual digestible food, and the substitution of new and less agreeable aliments, and experience has fully proved that nothing contributes more to the destructive progress of inflammatory action than such disturbance. This, however, is a subject upon which I cannot venture to enlarge here, because it involves the whole question of diet and nutrition in relation to scrofulous disease generally; but I am induced to dwell so far upon it because I so often see the evil effects of undue depletion and defective nutrition in scrofulous inflammation of the eye, and observe so frequently the reliance placed on medicinal remedies in its treatment, regardless of this most important means of arresting its progress and rendering its consequences less destructive. It should be understood that these observations are applicable to the treatment of all forms of inflammation of the eyeball, although I have reserved them for the present occasion, because it is in the scrofulous form of disease the necessity of attention to the digestive absorbent and nutritive functions becomes more urgent.

The practitioner should not confine his attention to diet alone in providing for the improvement of his patient's constitution by means not merely medicinal. Respiration of pure air frequently changed, the maintenance of the necessary amount of animal heat, and exposure to sufficient light, should not be neglected or forgotten. It is not only in the close, crowded, and uncleanly dwellings of the poor that attention to respiration of pure air is demanded, the sleeping-rooms and nurseries of affluent persons frequently require as much care, badly constructed as they generally are for the attainment of this object, and encumbered, as we frequently find them, with window and bed curtains, carpets, and unnecessary furniture. A volume might be written on the ventilation of sleeping apartments, and on

the contrivances which might be adopted to correct the defects of construction in our houses which render a free circulation of pure air impossible, the measures to be pursued with the same view in the crowded rooms of the poor in large towns, or of their cottages in the country, would require an equal amount of space for their suggestion. I can therefore do no more here than direct the attention of the practitioner to the subject, and leave it to his judgment and opportunities to apply a remedy. The maintenance of a salutary amount of heat in the system, especially in young persons, requires attention also, difficult, as it often is, to secure it in consequence of the direction of the currents of air flowing from the doors and windows to the fireplace. A temporary screen, with the necessary clothing and bed-covering, and in winter a fire of sufficient strength, will enable the attendants to effect this object. The exclusion of light or immuring the patient in total darkness is generally considered an essential part of the treatment in all inflammations of the eye, yet I am convinced that the practice is founded on erroneous views. It appears to be assumed that light must necessarily cause pain, and consequently irritation if admitted into an inflamed eye, but this is a mistake. Light, it is true, often does produce this effect, especially in the advanced stage of disease, and in peculiar forms of it, but as often do we find no inconvenience experienced by its presence. I therefore do not exclude light by closing the shutters or drawing the curtains, but merely as a precaution let down the sun-blind, or I direct the patient to sit with the back to the window or candles, as long as no complaint is made of pain from exposure; being convinced that in the majority of cases distressing intolerance of light is induced by rendering the eye more sensitive to it by the use of shades and curtains. These observations respecting diet and general management are more applicable to what is

called the after-treatment than to the first attempts to arrest inflammation, but I have made them here because I so often see the evil consequences of a disregard of such means followed by the worst consequences. The rule from the very commencement should be to avoid as much as possible making the patient an invalid, and in all cases where the practitioner can venture to do so, he should treat the patient without confinement to bed or bed-room, and even, if the weather be fine, allow exercise out of doors in shaded situations. The principles which I thus suggest to be applied in the treatment of serofulous inflammation of the eye have been advocated by writers on disease of this nature, both ancient and modern, and are therefore not advanced as original. Mr. Carmichael long ago inculcated similar doctrines in his essay on the Nature of Scrofula.

While treating of the other forms of inflammation of the eyeball, I entered at such length into inquiries respecting the value of the various remedies proposed for its relief, that it is unnecessary to reconsider them here in detail. Antimonials, mercury, iodine, turpentine, iron, cinchona, sarsaparilla, guaiacum, and even colchicum, may, I conclude, be made as available, with the necessary limitations which circumstances demand, in serofulous as in the idiopathic, syphilitic, or rheumatic species. It is necessary, however, to suggest some modifications of these agents to adapt them to the treatment of this form of disease. In a well-marked acute attack of iritis or inflammation of the eyeball occurring in a serofulous subject, mercury must be given as under similar circumstances in other varieties, but the practitioner should not forget that he has to deal with a constitution which will not ultimately bear with impunity the effects of this remedy as well as the ordinary or healthy one; and also that in such a state of constitution the beneficial effects of a full and free

course of mercury are not so apparent or decisive as in a sounder state of the system. The medicine should be more slowly and cautiously introduced, unaccompanied by that debilitating treatment so often adopted in other cases, and it may even be given in combination with tonics and during the use of nutritious food. The preparation to be used requires consideration. The blue pill, with or without opium, as the state of the bowels demands, will generally prove sufficient, and in less acute cases the compound calomel pill, commonly called Plummer's pill, may be found preferable. Corrosive sublimate (the muriate or bichloride of mercury) has been much extolled, and I believe extensively employed in this city in the more chronic or protracted forms of inflammation both of the eye and conjunctiva, but as the advocates of it generally direct it to be dissolved in tincture of cinchona, by which it is of course decomposed, no evidence of its superiority is afforded. The value of iodine as a remedy in inflammation of the eyeball has been considered when treating of the other forms of this disease. It is, however, in serofulous inflammation that its influence should be more relied on, if confidence is to be reposed in the opinion entertained respecting its virtues in this disease generally. I do not think that a practitioner would be justified in relying on iodine in any form as a means of arresting in its first stage acute inflammation of the eyeball caused or modified by serofula, but I think he may place reliance in it as an aid in the more advanced stages of the disease, either in combination with or following mercury. In cases of this kind the plan I pursue is to give mercury in moderation, until it begins to produce its usual effects, and then to commence with the iodide of potassium. Five grains of the *pilula hydrargyri* is given three times a day until the gums become affected, and then continued in five-grain doses at night only, giving from five to ten grains of the iodide of

potassium in the morning and middle of the day. After this has been persevered in until the mercury has had a fair trial, the pill at night is discontinued and the iodide substituted for it, either alone or in decoction of bark, if the stage of the disease and the state of the constitution demands it; or the iodide of iron in syrup in the dose of three or four grains daily is given. In those cases in which the inflammation is a repetition of former attacks, or a relapse, or where it has become refractory or chronic, mercury having been freely and repeatedly used before, the iodide of potassium or iodide of iron affords an obvious resource, and under such circumstances I have seen it, I think, effect as much as could be expected from any other remedy.

In the more advanced stages of the disease, or even at an earlier period if it does not yield to the remedies above enumerated, tonics and nutritious food, removal to a more healthy locality, and every other means usually resorted to in scrofulous affections, must be adopted. Cinchona or other vegetable tonics in such form as the practitioner may consider best suited to each individual case may be employed with advantage, and iron, either alone or in combination with other remedies, should have a trial. Patients residing in large towns should be removed to the country, and even from one locality to another differently situated. As to local treatment little remains to be added to the observations already made under this head in treating of the other species of inflammation, except enjoining more caution as to the application of blisters which in scrofulous subjects so often are the cause of enlargement of the cervical glands.

ON INFLAMMATION OF THE CORNEA.

IN the preceding chapters, I have treated of the different varieties of inflammation of the eyeball, whether simple and uncomplicated, or modified by peculiarity of constitution or disease of specific character; and in doing so I had to argue that these inflammations, although often considered to be confined to particular structures, generally, if not always, affect the entire organ; or at least during their progress extend to every portion of it. I have now, however, to direct attention to certain forms or species, which, from some peculiarity in their nature, occupy particular parts only, and do not necessarily spread to others: such are those which attack the cornea, the membrane lining the chambers of the aqueous humour, or the retina. Inflammation of the cornea of this character, the *corneitis* of writers on diseases of the eye, is the subject of the present chapter. In former inquiries I had repeatedly to notice how the cornea participates in the general inflammation of the eyeball from whatever cause arising, or however modified, and to describe with accuracy the changes to which it is subjected by inflammatory action; but in doing so I had not to call attention to the peculiar changes it undergoes in this more insulated form of disease, which are so remarkable that it fully justifies the nosologist in assigning to it a distinct specific character. I have now, therefore, to direct attention to this subject; and in order to do so with advantage, I consider it necessary to remind the reader of the very remarkable and complicated construction of this part of the organ. This may seem superfluous to those who assume that every practitioner has acquired this knowledge during the period of his anatomical studies;

but knowing as I do how very imperfect and incorrect the prevalent notions relative to this matter are, I entertain a different opinion. If in any case an exact knowledge of the structure engaged be necessary to enable the surgeon to understand the nature and extent of the changes produced in it by disease in general, and by inflammatory action in particular, it is particularly so in this, where such a variety of anatomical ingredients enter into the composition of the part. With the hope of supplying in some degree this knowledge, I here quote what I have already stated on this subject. To those who rest satisfied with the very meagre and incorrect descriptions of this structure contained in the systems of anatomy, the details here entered into may appear unnecessary refinements, but to those who know and feel that anatomical knowledge, unless ample and exact, only leads to error in diagnosis and treatment, they will appear perhaps insufficient. The following is extracted from the article on the anatomy of the eye contributed by me to Dr. Todd's Cyclopædia of Anatomy :

“ Although the cornea is in general description considered a simple and uniform membrane, it is undoubtedly composed of three forms of structure, as different from each other as any other three in the animal. These are, the conjunctiva, which constitutes the exposed surface ; the proper cornea, upon which the strength of the part depends ; and the elastic cornea, which lines the inner concave surface. The conjunctiva is evidently a continuation of the skin, which, reflected in the form of a vascular membrane, lines the eyelids, from which it is continued as a delicate transparent membrane over the anterior part of the globe, adhering loosely to the sclerotic, and closely to the cornea. The existence of the conjunctiva on the surface of the cornea proper admits of easy demonstration, and its identity of character with the rest of the conjunctiva and

skin of satisfactory proof. If the surface, shortly after death, be scraped with the point of a needle, the soft texture of the conjunctiva is easily torn and detached, and the tough, firm, polished surface of the cornea proper exposed; and if the eye be allowed to remain for forty-eight hours in water, the whole layer may, by a little care, be turned off in the form of a distinct membrane. During life, patches of the conjunctiva are frequently scraped off by accident, or by the point of the needle of the surgeon as he attempts to remove foreign bodies implanted in the cornea proper; it is also occasionally accidentally removed by lime or other escharotics. When the vessels of the conjunctiva over the sclerotic become enlarged, and filled with red blood in consequence of preceding inflammation, that over the cornea at length becomes equally red, and has its transparency greatly impaired by the vascular ramifications. In pustular ophthalmia, the pustules form on the conjunctiva over the cornea as well as on that over the sclerotic; and in small-pox vision is frequently destroyed by this part of the tegumentary membrane participating in the general disease. In cases where the surface is constantly exposed to the atmosphere in consequence of prominent staphyloma, or destruction or eversion of the eyelids, the conjunctiva of the cornea occasionally becomes covered with cuticle in common with the rest of the membrane. In animals over whose eyes the skin is continued without forming eyelids, the continuity of it over the cornea is obvious. In the mole-rat (*Aspalax zemni.*), where the skin is uninterruptedly continued over the eye, the hairs grow from the part over the cornea as well as from the rest. When snakes cast their covering, the cuticle is detached from the cornea as well as from the rest of the body; and when the skin is drawn off the body of an eel, it is detached with equal ease from the cornea as from the rest of the eye.

“The cornea proper, upon which the strength of this

part of the eye depends, is the structure to which the appellation *cornea* is generally exclusively applied; it is, as might very reasonably be expected from the office which it performs, a material of peculiar nature and organization, not identical with any other of the simple membranes. During life, and before it becomes altered by the changes which take place after death, it is perfectly transparent, colourless, and apparently homogeneous. This perfect transparency, however, depends upon the peculiar relation of the component parts of its texture, for if the eyeball of an animal recently dead be firmly squeezed, the cornea is rendered completely opaque, by altering that relation of parts, and as speedily recovers its transparency upon the removal of the pressure. The chemical composition of the cornea is similar to that of the fibrous membranes in general and the sclerotic in particular: like the latter structure, it is converted into gelatine or chondrine by boiling; but Berzelius states that it contains also a small quantity of fibrine or coagulated albumen, as proved by the formation of a precipitate upon adding the cyanuret of ferro-prussiate of potass to acetic acid, in which the membrane has been digested. The cornea possesses great strength, being seldom or never ruptured by blows on the eyeball, which frequently tear the sclerotic extensively. It does not yield to distension from increased secretion, effusion, or suppuration within the eyeball in consequence of inflammation, but it becomes extended and altered by growth both in shape and dimensions, as may be observed in prominent staphyloma, hydrophthalmia, and that peculiar alteration called *staphyloma pellucidum*, in which the spherical form of the membrane degenerates into a cone, but retains its transparency.

“The cornea is destitute of red vessels, yet it affords a signal example of colourless and transparent texture, possessing vital powers inferior to no other. No structure in

the body appears more capable of uniting by the first intention. The wound inflicted in extracting a cataract is often healed in forty-eight hours, yet the lips are bathed internally with the aqueous humour, and externally with the tears. Ulcers fill up, and cicatrize upon its surface; and although the vessels, under such circumstances, frequently become so much enlarged as to admit red blood, yet there can be no doubt that ulcers do heal without a single red vessel making its appearance. Abscesses form in the cornea, and contain purulent matter of the same appearance as elsewhere; they are generally said to be between the layers of the cornea, but they are evidently distinct cavities, circumscribed by the inflammatory process as in other cases; occasionally, however, the whole texture of the cornea becomes infiltrated with purulent matter, as the cellular membrane in erysipelas. The rapidity with which this membrane is destroyed by the ulcerative process is another proof of its superior vitality. In a few days a mere speck of ulceration, the consequence of a pustule, extends through the entire thickness, and permits the iris to protrude; and in gonorrhœal and infantile purulent ophthalmia, the process is much more rapid and extensive. It is true that in the latter case the destruction is attributed to gangrene or sloughing, and to a certain extent correctly; but an accurate observer must admit that the two processes co-operate in the production of the lamentable consequences which result from these diseases. Ulcers of the cornea fill up by granulation and cicatrize as in other parts of the body, but the repaired part does not possess the original organization, and is consequently destitute of that transparency and regularity of surface so essential for its functions; hence the various forms and degrees of opacity enumerated under the technical titles of *albugo*, *leucoma*, *margarita*, *nebula*, &c., which are probably never remedied, however minute they may be, notwithstanding

the general reliance placed in the various stimulating applications made for this purpose. Slight opacities, or *nebulæ*, as they are called, if confined to the conjunctival covering of the cornea, gradually disappear after the inflammation subsides, as does also diffused opacity of the cornea itself, the consequence of serofulous inflammation; but I believe opacities from ulceration and cicatrix are seldom if ever removed. The effect of acute inflammation is to render this, and perhaps all transparent and colourless membranes, white and opaque without producing redness; this may be seen in wounds, where the edges speedily become gray; and in the white circle which frequently occupies the margin of the cornea in the inflammations of the eyeball commonly called iritis.

“The cornea in a state of health is destitute of sensibility. Of this I have frequently satisfied myself by actual experiment in cases of injury of the eye, where the texture of the part is exposed. When foreign bodies, such as specks of steel or other metals, are lodged in its structure, the surgeon experiences much difficulty in his attempts to remove them, from the extremely painful sensibility of the conjunctiva as he touches it with his needle; but the moment he strikes the point of the instrument beneath the foreign body into the cornea itself, the eye becomes steady, and he may touch, scrape, or cut any part of the membrane uncovered by conjunctiva without complaint.

“It has already been stated that the cornea, as it constitutes the transparent medium for the passage of the rays of light, is composed of three distinct forms of structure altogether different from each other, the conjunctiva, the cornea proper, and the elastic cornea. The latter membrane is now to be described. In many of our books this membrane is vaguely alluded to as the membrane of the aqueous humour; but with this it must not for a moment be confounded. It is a distinct provision for a spe-

cific purpose, totally different from that for which the other is provided. It was known to and described by Duddell, Decemet, Demours, and latterly by Mr. Sawrey ; but all these authors having unfortunately published their accounts in separate and probably small treatises, not preserved in any journal, I have not been able to consult them. It is, however, distinctly recognized by Clemens, D. W. Sommerring, Blainville, and Hegar ; and in a paper on the anatomy of the eye in the *Medico Chirurgical Transactions*, I endeavoured to direct attention to it without effect. The structure here alluded to is a firm, elastic, exquisitely transparent membrane, exactly applied to the inner surface of the cornea proper, and separating it from the aqueous humour. When the eye has been macerated for a week or ten days in water, by which the cornea proper is rendered completely opaque, this membrane retains its transparency perfectly ; it also retains its transparency after long-continued immersion in alcohol, or even in boiling water. When detached, it curls up and does not fall flaccid or float loosely in water, as other delicate membranes. It also presents a peculiar sparkling appearance in water, depending upon its greater refractive power ; in fact, it presents all the characters of cartilage, and is evidently of precisely the same nature as the capsule of the crystalline lens. When the cornea proper is penetrated by ulceration, a small vesicular transparent prominence has been repeatedly observed in the bottom of the ulcer, confining for a time the aqueous humour, but ultimately giving way, and allowing that fluid to escape, and the iris to prolapse ; there can be little doubt that it is this membrane which presents this appearance. In syphilitic iritis, this membrane becomes partially opaque, appearing dusted or speckled over with small dots altogether different in appearance from any form of opacity observed on the conjunctiva or cornea proper. When it has been touched

by the point of the needle in breaking up a cataract, an opacity is produced closely resembling capsular cataract. There is no difficulty in preparing and demonstrating this membrane in the eye of the sheep, ox, and especially the horse, and it may with a little care be exhibited in the human and other smaller eyes. The eye of a horse having been macerated in water for six or eight days, or until the cornea proper becomes white, should be grasped in the left hand, so as to render the anterior part plump, and then inserting the point of a sharp knife into the structure of the cornea at its junction with the sclerotic, layer after layer should be gradually divided by repeated touches round the circumference, until the whole thickness is cut through and the transparent elastic cornea appears, after which the cornea proper may be turned off by pulling it gently with the forceps. The use of the elastic cornea does not appear to me doubtful. The crystalline lens is lodged in a capsule of precisely the same nature, evidently destined to preserve correctly the curvature of each surface of that body, a condition obviously necessary to secure the perfection of the optical mechanism of the organ. The elastic cornea in the same way, by its firmness, resistance, and elasticity, preserves the requisite permanent correct curvature of the flaccid cornea proper.

“The cornea proper is closely and intimately connected to the sclerotic at its circumference. There does not appear to be any mechanical adaptation resembling the fitting of a watch-glass into the bezel, as stated in books; but a mingling of texture, as in many other instances in the body. The two structures cannot be separated without anatomical artifice and much violence. If the eye be macerated in water for a month, and then plunged into boiling water, the cornea may be torn from the sclerotic; but these destructive processes prove little with regard to animal organization. The conjunctival covering of the

cornea is, as has been already stated, continuous with the rest of the conjunctiva, and the elastic cornea is continued for a short distance beneath the sclerotic, as if slipped in between it and the ciliary ligament.

“The cornea, thus composed of three different structures, varies in appearance at different periods of life. In the fœtus at birth it is slightly cloudy, and even of a pinkish tint, as if it contained some red particles in its blood; this is, however, more apparent on examination after death than during life; it is also thicker in its centre. In old age it is harder, tougher, and less transparent than in youth, and frequently becomes completely opaque at its circumference, presenting the appearance denominated in the books *arcus senilis*. How far the alteration in the power of adaptation to distance, which occurs in advanced life is to be attributed to change in curvature of the cornea, is not settled.

“If the foregoing account be correct, the apparently simple transparent body which fills the aperture in the anterior part of the sclerotic, is composed of three distinct varieties of organic structure, liable to changes from disease equally distinct and varied. When the aqueous humour becomes the subject of description, I propose to show that there is good reason for believing that a fourth may be added to these three, the membrane which lines the chamber in which this fluid is lodged, and by which it is secreted. Let it not be supposed that this division of an apparently simple piece of organization into so many distinct parts, is merely an exhibition of minute anatomical refinement. The distinction is essentially necessary to enable the surgeon to account for the appearances produced by disease in this part, and to guide him in the diagnosis and treatment.”

In describing the chambers of the aqueous humour, I have stated the following facts and arguments in support

of the conclusion that the back of the elastic layer of the cornea is covered or lined by a delicate membrane of serous character, and whatever may be thought to the contrary, the decision of the question is necessary to enable the practitioner to account for appearances which present themselves during the progress of inflammation:

“ The aqueous humour is generally believed to be secreted by a membrane lining the cavity, as the fluid which lubricates the serous cavities is secreted by their lining membranes. Although this is in all probability the fact, the circumstances are not exactly the same in both cases. In the serous cavities, merely as much fluid as moistens the surface is poured out, while in the chamber of the aqueous humour sufficient to distend the cavity is secreted. In the serous cavities the membrane from which they derive their name can be demonstrated ; in the chamber of the aqueous humour this can scarcely be accomplished. I have resorted to various methods to enable me to demonstrate the existence of the membrane of the aqueous humour on the back of the elastic cornea, such as maceration, immersion in hot water, soaking in alcohol, and treating with acids, alkalis, and various salts, but without effect. In describing the structure of the cornea, I have shown that the elastic cornea itself cannot for a moment be considered the membrane in question, on account of its strength, thickness, elasticity, and abrupt termination ; and I do not think that the demonstration of a serous membrane expanded on such a structure as transparent cartilage is to be expected, inasmuch as the demonstration of the synovial membrane on the cartilages of incrustation in the joints is attended with much difficulty. The pathological fact which tends most to prove the existence of such a membrane here is, that in iritis, especially that of syphilitic character, the aqueous humour appears often very

muddy, especially in the inferior half of the chamber ; this, however, in the latter stages may be found to arise from a delicate speckled opacity on the back of the cornea, which remains permanently, and injures vision considerably. Analogy also favours the inference that the whole cavity of the chamber must be lined by serous membrane, inasmuch as all structures, of whatsoever nature they may be, in the serous or synovial cavities, are so covered or lined. This provision is so universal, that if such various structure, as the elastic cornea, iris, capsule of the lens, ciliary processes, and hyaloid membrane, which enter into the construction of the chamber of the aqueous humour, be exposed to the contact of the fluid without any intervening membrane, it constitutes an unexpected anomaly in the animal economy. The consequences of inflammation greatly strengthen the conclusion that the cavity is lined by a membrane of the serous character. The slightest injuries or even small ulcers of the cornea are frequently accompanied by effusion of purulent matter into the anterior chamber, from the extension of the inflammation into that cavity, constituting the *hypopion* or *onyx* of the books ; and the yellow masses which appear on the iris in syphilitic iritis, whether they are abscesses, or as they are called, globules of lymph, are effusions beneath a delicate membrane, as vessels may be seen with a magnifying glass, ramifying over them. In iritis the rapidity with which adhesions are formed between the margin of the pupil and the capsule, proves that these two structures are covered by a membrane of this nature. In addition to all these facts, the still more conclusive one is to be adduced—namely, that the membrane can without difficulty be demonstrated on the back of the iris, as I have stated in speaking of that part of the organ.”

In studying the structure of this transparent lenticular

body called the cornea, it is not only essential that these distinctions between its component parts should be well understood to enable the practitioner to account for the changes which take place in it from disease, but it is also necessary that he should recollect that even a fourth layer of an equally dissimilar character must be taken into consideration. This is the cuticle, epidermis, or epithelium, which covers the exposed face of the part and is expanded over the conjunctival layer. I do not allude to any fanciful creation of the microscope, but to a coherent material, the existence of which analogy at least makes probable, and the consequences of disease sometimes renders visible, although not to be demonstrated to a naked eye. It is not, perhaps, entitled to much consideration with reference to the physical or optical properties of the corneal lens, but in a pathological point of view it is worthy of notice, seeing that a knowledge of its existence may sometimes explain appearances not otherwise to be understood.

As I have just stated, I have already described how the cornea is affected in the various forms of inflammation of the eyeball. It is, however, very remarkable that when it is attacked separately, the appearances it presents, and the changes it undergoes, are very different from those observed in the other case; and still more remarkable, that they are very different from those observed when it is inflamed in consequence of a wound or other injury directly inflicted upon it. In treating of inflammation of the eyeball following gonorrhœa, I had to allude to this peculiarity, and to observe, that as this species was more of the nature here stated, it was to be looked upon as a *corneitis* rather than an *iritis*. In true acute *corneitis*, a general and diffused opacity of the cornea, and redness of the sclerotic from inflammatory vascularity, are the appearances which arrest attention. The sclerotic vascu-

larity is not, however, the brilliant red so conspicuous in general inflammation of the eye, or so much distinguished by the appearance of separate converging vessels; but rather a true purple, uniformly diffused, and often more in patches than completely surrounding the cornea. On a careful examination the opacity of the cornea will be found to extend to all its component structures. The conjunctival layer is not only milky or hazy, but rough or irregular on its surface, as if thickly studded with very minute transparent pustules or rather vesicles; but these elevations are not of this nature. This state of the conjunctival layer does not, however, uniformly exist to a very remarkable degree, but when it does, it is highly characteristic, and well calculated to enable the practitioner to distinguish the disease. In no case of true corneitis is this roughness or loss of polish entirely absent, although in some it is less conspicuous from not being accompanied by milkiness or opacity; and sometimes when viewed directly in front with the patient's eye facing the light, it is distinctly iridescent. It may seem superfluous to enlarge thus on appearances arising from changes so minute, and practical men may think such descriptions far-fetched and too refined; but as the object is to enable the surgeon to form a correct diagnosis of this form of disease, which is often obscure, it is necessary to be thus particular. The change described is also worthy of notice, because it affords an opportunity of observing the more delicate alterations of the cutaneous surface produced by inflammatory action. The conjunctival layer of the cornea is, as has already been stated, a continuation of the true skin, coated with its epithelium; and being so, its surface is not so exquisitely polished as might at first sight be supposed. On the contrary, it is really comparatively rough, being villous, and exhibiting like the rest of the skin an arrangement of waving lines intersecting each

other. In fact, the beautiful polish of the cornea, so essential towards its perfection as a lens, is due to the tears which fill up the irregularities to which I allude, and which are provided for this particular purpose. This state of the surface must not, however, be confounded with minute ulcers which sometimes form upon it during the progress of the disease.

The changes which take place in the cornea itself, what I am in the habit of calling the cornea proper to distinguish it from the conjunctival covering and the elastic membrane on its back, are as remarkable and peculiar as those I have been describing. In general inflammation of the eyeball, whether simple and idiopathic, or complicated and specific, no matter how intense, the cornea remains, if not always, at least generally, perfectly transparent, except for a short distance at its margin ; and even there not uniformly so : but in the disease now under consideration it becomes milky, hazy, or opaque throughout. In acute cases of rapid progress, and especially in younger subjects, this opacity is uniformly diffused : it, however, varies in degree ; being sometimes little more than a muddiness which obscures the view of the iris, in other cases so great that the pupil cannot be distinguished through it, and in others, again, so perfect that it is almost white. In less acute cases, and of slower progress, such as are oftener observed in growing young women, the opacity is often more irregular ; appearing in patches or large spots or specks with transparent spaces between them. Of whatever form, the opacity becomes more dense and permanent as the disease lingers or becomes chronic, until at length the whole cornea becomes as white as the sclerotic itself. The true cause of this opacity or loss of transparency does not appear to be well understood. By some it is attributed to an effusion of lymph, but there is no evidence of the existence of any such deposit ; neither

is the colour or appearance of the part such as to warrant a conclusion of the kind. It has also been attributed to an increase in the quantity of the fluid which naturally and ordinarily pervades the structure of the part; but this is also but an assumption, or a theoretical explanation which may or may not be correct. A condensation or agglutination of the component cellular, areolar, or laminated texture of the corneal structure, has also been supposed to result from the inflammatory action, and to be sufficient to account for the change, but this again remains without proof. In fact, a very inconsiderable amount of alteration in the disposition or adjustment of the organized material composing the part, or of the fluid which pervades it, would probably be sufficient to impair its transparency. If the eye of an animal recently killed, and yet warm, be firmly squeezed in the hand, the cornea becomes nearly white, and instantly resumes its perfect transparency on relaxing the pressure; thus proving that as in other bodies the transparency depends on a certain arrangement of material which the inflammatory action disturbs. Be the cause, however, what it may, the opacity does not depend on any permanent or incurable disorganization of the structure of the cornea, for it rapidly disappears when the inflammation is arrested at an early period; and even when very dense, and apparently arising from a complete destruction of the natural or original texture of the part, induced by protracted inflammatory action or repeated attacks, it recovers its transparency contrary to all expectation. I have repeatedly seen the corneæ of both eyes, nearly as white as paper throughout, become in some months, or perhaps a year, as clear as crystal. It is, in fact, this diffused opacity of the cornea, unaccompanied by actual disorganization or change of structure, whether caused by this disease or remaining round *cicatrices* from wounds or ulcers, which has acquired for prussic acid and

other nostrums whatever character they enjoy. The truth is that these opacities gradually disappear as all inflammatory action subsides, and as the part returns to its original condition ; and in some cases this process of restoration is probably hastened or even induced by stimulating applications, although in others it is sometimes interrupted or retarded by them.

The cornea proper undergoes other changes also in this disease. Red bloodvessels may make their appearance in it, abscesses or insulated and circumscribed deposits of matter may take place in its texture, or ulcers may break out on the surface. In the acute or early stage of this inflammation no red bloodvessels make their appearance, as they do so rapidly and in such profusion in the transparent conjunctiva covering the sclerotic, and in the sclerotic itself. It is not until the inflammatory action has been protracted, or repeated by frequent relapses, becoming, as it is called, chronic, that red vessels are to be seen. Then they undoubtedly are sometimes present in the shape of distinct tufts of a deep red colour, and apparently venous. I know not how those who maintain that the cornea lives and grows without bloodvessels can well account for this appearance of them. They will probably say that they are a new creation, the consequence of inflammation ; but I look upon their occurrence as a proof that this structure presents no exception to the general rule of growth by vascular ramification in the human frame. Be this, however, as it may, they subsequently gradually become invisible, contracting in diameter so as no longer to exhibit colour. True circumscribed abscess, or even deposition of purulent matter in a diffused form, I believe seldom if ever occurs in this disease, although such a consequence is not at all uncommon in inflammation of the cornea from wounds or irritable ulcers, or in violent purulent ophthalmia. I have sometimes, however, seen distinct whitish

spots deep in the structure of the part which break into ulceration, and consequently are followed by *cicatrices* constituting the permanent incurable opacities called *albugo* or *leucoma*. I have already said that ulceration sometimes takes place in the conjunctival layer, and this generally eats into the cornea proper, leaving the smaller opacities, called either pearls or *nebulae*, after them.

Of all the changes, however, which are observed in the cornea during the progress of this disease, there is not any more remarkable or instructive than that which takes place in its form and dimensions. It becomes more prominent, and its shape is altered, appearing as if expanded by an increase in quantity of the aqueous humour, and converted from a lens of nearly spherical surface to one of much more complicated curve. This change, it is true, does not always take place; but when the disease is protracted and refractory, and makes that slow progress which has procured for it the title of chronic, it generally does so. In enumerating the effects produced in the cornea in general inflammation of the eyeball, I have not failed to mention the alterations in its shape which take place in neglected or mismanaged cases, or where the disease does not yield to active and judicious treatment; but I have also mentioned that these alterations do not take place at an early stage, but are the result of chronic or protracted inflammation. In the disease now under consideration, however, the true corneitis, this change in form and dimensions, often occurs in the acute stage, and is observed as one of the first symptoms. It has been attributed to an increased secretion of the aqueous humour, the result of inflammatory action causing an accumulation which mechanically distends or stretches the part; but when the great thickness, unyielding nature, and enormous strength of this structure comes to be considered, this explanation cannot for a moment be admitted. No force which can be applied after

death is capable of effecting any such alteration; and if during life any such were exercised, the result must be blindness from the extension of the same pressure to the retina, and interruption of the circulation by its operation on the choroid. It is, in fact, as I have said in describing the effects of common inflammation of the eyeball, a process of morbid growth or perverted nutrition, a vital operation carried on during the suspension of that wonderful influence, whatever it is, which in the natural, ordinary, or usual state, controls and guides organization. There is not, perhaps, in the whole animal economy a more remarkable or beautiful example of the effect of that controlling vital power which governs nutrition than the preservation of its correct lenticular form by the cornea during the course of a long life, accomplished as it is without any apparent physical intervention. A deviation from the ordinary correct mode of growth in consequence of an interruption of the influence which keeps it within bounds, is in fact what might be anticipated from the operation of inflammatory action, and it is not in the cornea alone it is seen, for it is equally conspicuous in the sclerotic and other structures. The alteration in form is not always of the same shape. The surface is sometimes apparently spherical, sometimes an irregular spheroid, and sometimes projecting at one side more than another; but the most remarkable deviation is that wherein it becomes conical and acquires the peculiar form which in the sequel constitutes the very remarkable and singular result of disease called *staphyloma pellucidum*. I am prepared for a denial of the correctness of this statement, that the *staphyloma pellucidum*, or conical cornea, is owing to the disease under discussion, but I nevertheless venture to insist upon it, because I have seen and traced the change from its commencement to its termination more than once. That there should be doubt and difference of opinion on the subject is

not surprising, because true corneitis is not a very common disease, and the change in shape to the conical is not a frequent consequence of it. The alteration takes place in childhood, for the disease generally occurs at that period of life ; and after the inflammation has disappeared and the opacity has been dissipated, no defect except this conical state remains ; which is not perceived until the young person is called on to apply the eye to books, or to work requiring good sight. Then it is that the surgeon's attention is directed to the case, and he for the first time sees it, and, perhaps naturally enough, thinks that it is a disease in progress, and only recently commenced. Hence the difference of opinion respecting its nature, and the various speculations as to its origin. That I have seen the cornea become opaque from corneitis, then conical, and finally perfectly transparent, retaining its conical form, I am quite positive ; but not only have I seen this, but also have I seen it become distinctly conical in a case of common idiopathic inflammation of the eyeball in a man of middle age, although not transparent or resembling the true *staphyloma pellucidum*.

In true *corneitis* the elastic membrane which is applied to the back of the cornea proper, the membrane of Demours or Decemet, although not frequently altered in structure, is sometimes rendered opaque. The opacity is not, however, diffused, or like that of the cornea itself, causing a hazy or milky appearance, but distinct and circumscribed. At first sight it appears as if situated superficially in the substance of the cornea proper, or even in the conjunctival layer ; leading the practitioner to think that a pustule or incipient abscess exists ; but on closer inspection it is observed to be very deep, and to be very different in shape and colour from these consequences of inflammation. One or more well-defined circular gray or whitish dots, varying in dimensions from a diameter of a 12th or 20th

of an inch to a mere point, is the usual state of this opacity; most frequently, perhaps, one large spot with a second smaller, and a third still smaller, at a short distance from each other, but not mixing or running together. They have not the pearly white appearance of small circular permanent opacities of the cornea, nor the brownish tint of opacities of the membrane of the aqueous humour, but something between them, which may be called a dirty white. Looking directly into the eye, they appear, as I have said, to be in the substance of the cornea proper, but looking sideways, or from above downward through the edge of the cornea, they may be seen distinctly to occupy its posterior surface. It is almost necessary to apologise for entering into an elaborate description of changes so minute, and many may think that such distinctions are but unnecessary refinements, or even perhaps that they are noticed in order to display accuracy of observation; but considering as I do this elastic membrane to be a part of great importance towards perfecting the optical mechanism of the eye, and believing that if altered by inflammation, the alteration must be of a peculiar nature, I cannot pass over the subject in a slovenly manner. I may, however, be told that in asserting that these opaque dots are in the membrane of Demours or Decemet, I do but assume a fact which I cannot prove; but seeing, as I have said, that they are certainly on the back of the cornea, and entirely different from the usual opacity of that structure, as well as from the opacity which takes place in the membrane of the aqueous humour, I think I am fully justified in the view I take of them. It is necessary to add, that they do not always, or perhaps even frequently, exist, and I think that they generally disappear as the inflammatory action subsides, or its effects become dissipated.

The membrane lining the chamber of the aqueous humour probably partakes of the inflammation in *corneitis*,

in many cases throughout, and more or less in all. I have stated the reasons which justify the conclusion that the back or inner surface of the elastic membrane of Demours or Decemet is covered or lined by this membrane ; and in describing the changes produced by inflammatory action upon it in the various forms of inflammation of the eyeball, I have directed attention particularly to the peculiar opacity produced. This is the very remarkable speckled or dotted appearance, seen perhaps most frequently in syphilitic and serofulous inflammation of the eyeball, but occasionally in simple uncomplicated idiopathic inflammation. When it occurs in *corneitis*, it is probably at first obscured by the opacities of the conjunctival layer, the cornea proper, or the membrane of Demours ; but when these are dissipated, it becomes very conspicuous : I have, however, seen it in the earlier stages when the other parts remained free from opacity. It can scarcely be confounded with the opacities which I have described as occurring in the elastic membrane, it being a patch of minute gray dots clustered together, but at the same time perfectly distinct, and disposed at regular distances ; while the other opacities are large, white, and few in number. The extension of the inflammation to the whole of the membrane of the aqueous humour is proved by the adhesions which are sometimes found to take place between the margin of the pupil and the surface of the capsule of the crystalline lens. The iris itself is often, if not generally, involved, remaining tremulous, paralyzed, and discoloured, after the inflammation subsides ; and sometimes having the pupil irregular in shape or eccentric : and not unfrequently dilated from the beginning. Whether owing to change in the condition of the iris or cornea, the anterior chamber, in cases where the disease has been protracted, is very much enlarged, without any apparent corresponding alteration in form in the external parts of the eye ; and often

the anterior part of the sclerotic gives way, and the eye assumes the shape of that of a bird. Notwithstanding this extension of the disease from the cornea to these structures, it undoubtedly is more circumscribed or confined to its original seat than in the other forms of inflammation, and rarely spreading to the crystalline lens or retina. I have often been astonished at the amount of vision enjoyed by patients who had suffered repeated attacks or relapses of this disease, causing the most extensive destruction and deformity of the anterior parts of the eye, while the posterior parts remained uninjured. In the worst cases, however, the disease extends to all parts of the organ. The sclerotic yields in various places, displaying blue or black prominent elevations; the choroid beneath becoming visible through the thin and distended membrane, as happens in most forms of general inflammation of the eyeball, long continued and terminating badly; or it becomes more uniformly expanded, presenting an irregular sphere composed of black patches in whitish spaces, interspersed with blue veins. Sometimes the entire globe of the eye becomes more equally enlarged, and with less of this thinning of the sclerotic and the discoloration which attends it; until at last it becomes entitled to the denomination of hydrophthalmia.

In the disease which I have been describing, when it presents the characters I have enumerated, and is not complicated with serofulous or other disease, or modified by mismanagement, there is, I think, little of the pain either in the eye itself or in the brow and temple, which is experienced in other forms of inflammation. There is of course uneasiness, and when the conjunctiva is engaged, a sensation of a mote under the eyelid: but not the dull aching pain of more general disease of the eyeball. Neither is there much intolerance of light in any case, and in general there is little or none, unless induced by confinement in a dark close room, or by the use of a shade or thick veil.

Vision is generally impaired to the extent which the cloudiness of the cornea necessarily entails, but it is seldom so much interrupted as it is in inflammation of the entire eye ; when it is very much diminished, or nearly lost, and especially when at the same time the pupil is largely dilated, the prognosis must be less favourable, because in such case the inflammation has extended to the deeper seated parts.

True *corneitis* can scarcely be traced to any particular cause. In treating of the inflammation of the eye which sometimes follows gonorrhœa, and accompanies what has been called gonorrhœal rheumatism, I mentioned the resemblance of that disease to this now under consideration ; and in other forms of rheumatic inflammation of the eye there is a similar resemblance, but no such constitutional derangement exists in the usual cases. It has been considered serofulous, and even named serofulous corneitis, but my experience leads me to doubt the correctness of this view. When the disease takes place in truly serofulous persons it undoubtedly pursues a more violent course, and presents a more exaggerated character, but there is no proof that it arises from the existence of the constitutional disease. On the other hand, the disease is not only often seen in patients exhibiting no trace of serofula whatever, but it really appears to occur much more frequently in subjects free from that disease. It has been usual to consider more diseases of the eye than this to be of a serofulous nature, and to name them so, but this is often done on insufficient grounds. The progress of inflammation may be slow and destructive, and the treatment of it difficult and unsuccessful, and yet it may not be serofulous in its origin, or even modified by that disease. The very cases appealed to as evidence of the specific character of the disease are often the very cases which prove the contrary ; being, in fact, examples of persons exposed to all the influences which usually induce

the scrofulous diathesis, and yet are not so affected. The disease in question is, in fact, a disease of early life, generally of childhood, and perhaps, compared with other diseases of the eye, not very common. It might even be said that it is confined to the period between seven and fifteen, or that of the second dentition; and perhaps it might be suspected to depend in some degree on the irritation caused by that process, as another form of inflammation of the eye is undoubtedly to be attributed to the growth and cutting of the milk teeth. It is true that an inflammation of the eye involving the cornea occurs in young women from puberty to mature age, but it is not the true corneitis which I have been describing. The children attacked most frequently are those of the poor, unprovided with the three great requisites, nutritious food, pure atmosphere, and warm clothing. They are meagre, sallow, and shrivelled, rather than œdematous, flabby, and pallid, as the children reared in nurseries. I have, however, occasionally seen the disease in plump and rosy children, who have been well fed, comfortably clothed, and lodged in healthy localities.

The treatment of this inflammation of the cornea is not so simple or so free from difficulty as that of common idiopathic inflammation of the eyeball. Modified as the disease generally is by a feeble state of the system depending on defective nutrition, depletion can seldom be resorted to with a prospect of advantage; and in the majority of cases can scarcely be resorted to at all with safety. Both Mr. Lawrence and Dr. Mackenzie recommend abstraction of blood by leeches or cupping, but not by general bleeding, early in the disease and when the inflammation is active. I have not myself often resorted to these means, but there are cases in which the application of leeches may prove serviceable. It is necessary, however, to observe, that whether it be from habit and early impressions, or in

consequence of the prevalence of a more plethoric temperament, in Great Britain, depletion in general, and abstraction of blood in particular, is more enjoined there than to me appears necessary or desirable. I often feel inclined to think that I err in not adopting the practice, but looking to the results I become less inclined to do so ; and in the disease now under consideration, I very seldom resort to it. The state of the stomach and alimentary canal, as indicated by the tongue and discharges, should be particularly attended to at the commencement. After the bowels have been emptied by any simple purgative, a few grains of the *pil. hydrargyri* or the *hydrargyrum c. creta* may be given at night, followed by a dose of solution of magnesia once or twice the following day to correct acidity, and keep up a moderate amount of purgative effect for a short time.

After depletion mercury is relied upon in all inflammations of the eye, and therefore in this. Nevertheless its salutary operation is not so conspicuous as it is in some other forms of disease. I have given it a fair trial alone in several cases, not only without benefit, but I think the reverse, and I now seldom resort to it except in the shape of what is called an alterative : that is, in fact, in smaller doses than those usually given to produce soreness of the mouth and ptialism. What the real difference in effect may be between mercury administered in small doses, and the same agent given in larger doses, does not appear to be well understood, or whether indeed there is any. It seems to be assumed that to arrest inflammatory action a large quantity of the metal must be accumulated in the system, and it is therefore generally given with this view until it begins to produce its poisonous effects ; but it remains to be proved that the full salivation relied on as evidence of this accumulation is after all a conclusive proof of it, or that this maximum charge (as it may be called) of the remedy, is necessary to secure its peculiar specific action. Keeping

the system for a great length of time under the influence of mercury by the continued administration of small doses to counteract the operation of some disease, or to promote absorption of some deposit, is a different question from this. What it is desirable to determine is the quantity of the medicine required to allay acute inflammation, and whether it should be proportioned to the activity of the symptoms, and this does not seem to be ascertained. In no branch of surgery is the empirical and indiscriminate use of mercury more displayed than in the treatment of diseases of the eye, and therefore have I to express doubts as to its application in the present case. As I have said, I generally prefer giving it in small doses in the disease under consideration, unless where the inflammation is very acute and active, and sometimes I do not give it at all. Two or three grains of the *pilula hydrargyri*, according to the age of the patient, may be given two or three times daily for a few days, by way of foundation, and then about three grains every night, leaving the day time for the administration of other remedies. In treating of syphilitic, rheumatic, and scrofulous inflammation of the eye, I have repeatedly alluded to these remedies. In the present form of disease, iodine, iron, and bark, appear most entitled to confidence. The iodide of potassium may, as I formerly stated, be given alone or in decoction of bark, or if reliance be placed in sarsaparilla, as met with in this country, it may be given in combination with it. Bark, or any of its products or preparations suited to the stomach and constitution, is probably more to be relied on than iodine. It is unnecessary here to enter into a discussion as to the comparative value of the different preparations of this remedy; it is only necessary to remind the practitioner that it is here to be given more as a tonic than, as in other cases, to exercise a specific antidotal influence; and that the patients being young, it is desirable to disguise its

bitter taste, and to render it as little offensive to the stomach as possible. In whatever form administered, it may be given, either alone or in combination with the iodide of potassium, even while the patient is taking mercury as above suggested in the alterative form, ordering a dose of these remedies in the morning and middle of the day, while the other is continued at bed-time. After this plan has been pursued for such a length of time as may be considered sufficient to produce the requisite constitutional change, the mercury given at night should be discontinued, and a dose of the iodine and bark, or bark alone, substituted for it, and in this way continued for some time longer. Should this fail, or should it be considered necessary to give trial to other remedies, iron may be added to them, or given in place of them. A grain or two of iodide of iron, as contained in the syrup of iodide of iron, may be given three times a day, or such preparation of bark and iron as may be found appropriate.

Local applications, except a sedative stupe or tepid lotion, with the view of allaying pain if present, are not called for, and in the early and acute stage, such stimulating applications as solution of nitrate of silver or the *vinum opii*, sometimes resorted to, should of course be carefully avoided. At a subsequent period, when the increased vascularity and sensibility of the conjunctiva, induced by the inflammatory action, exist, during what is generally considered the chronic stage, remedies of this description may be used with advantage, but as the principal mischief is so much beneath the surface, and so liable to be aggravated by any irritation, great caution must be exercised in their application. For the removal of the diffused opacity of the cornea proper, which I have described, stimulants may be employed, but not until every trace of inflammatory action has long disappeared. From the variety of stimulants used from time immemorial to

remove opacities of the cornea, and the number of them extolled as infallible, it may be presumed that any stimulant will answer the purpose. Solutions of nitrate of silver, sulphate of copper, sulphate of zinc, or the combination called *lapis divinus*, will perhaps answer. I use a solution of iodide of potassium, ten grains to the ounce of water; or, as a substitute for animal bile, said to be effectual, touch the surface with the camel-hair pencil previously dipped in water and brushed two or three times on soap. The fumes of prussic acid, so much vaunted as a quack remedy, I have not used, being dangerous and troublesome. If this nostrum has any influence at all, it is as any other stimulant. It should be recollected that this diffused opacity not being a cicatrix from ulceration disappears in time, and I have no doubt that its disappearance is often delayed by the premature and unnecessary use of stimulants. It is not to be forgotten that as the inflammation frequently, if not generally or always, extends to the membrane lining the chamber of the aqueous humour, the pupil should therefore be occasionally dilated by belladonna to prevent adhesions. A sedative lotion containing a drachm of good extract of belladonna in eight ounces of fluid applied with a scrap of old linen occasionally during the day, will answer the purpose, and if it does not, the outside of the eyelids and the brow must be painted with the softened extract.

It is scarcely necessary to add, that for the removal of this disease, the apparent cause of it, or at least the cause of the predisposition to it, should be removed. Generous diet, pure air, and comfortable clothing, will often do more than any medical treatment. I have more than once seen it disappear in an ill-fed, badly clothed child, after removal from a close room in the city, or a damp cottage in the country, to a comfortable bed in the hospital, without the administration of any medicine.

ON INFLAMMATION OF THE CHAMBER OF THE AQUEOUS HUMOUR.

A SPECIES of inflammation confined to the membrane lining the chambers containing the aqueous humour has been enumerated amongst the inflammatory affections of the eye, and distinguished by the title of *Aquo-capsulitis*. Doubts appear, however, to be entertained respecting the existence of such a disease in so insulated a form as to justify its claim to distinct specific character. The confidence of surgeons in the statements of writers on diseases of the eye has been shaken in consequence of the propensity indulged in by them to describe the mere varieties or modifications of a disease or its consequences, as permanent species. I believe, however, that there really is an inflammation of this character, and that it is so peculiar in its nature, symptoms, and progress, that it should be studied apart from the other forms. I do not mean to say that all cases in which the membrane of the chambers of the aqueous humour is inflamed are to be considered examples of the disease now to be noticed; I would only insist that this membrane is sometimes inflamed without any accompanying inflammation of the other parts of the eye; and it is this insulated species which I have now to notice. The membrane of the chambers of the aqueous humour is probably inflamed in all general inflammations of the eyeball, whether simple and idiopathic, or complicated and specific; and even in the inflammation of the cornea called *corneitis*. In that form of inflammation more particularly entitled to the denomination of *iritis*, in consequence of the iris being conspicuously affected by the disease, this membrane is generally, if not always, engaged; and hence the adhe-

sions of the margin of the pupil to the capsule of the crystalline lens, as well as the mottled opacity on the back of the cornea.

When treating of specific inflammation of the cornea, I endeavoured to prove that the chambers of the aqueous humour are lined by a delicate membrane, and that this membrane is probably of the same nature as those lining the serous cavities. As it is of importance, with a view to a correct knowledge of the nature of the disease and its successful treatment, that this should be well understood, I have to repeat that the existence of such a lining membrane, even without an absolute demonstration of it, may with safety be admitted from the fact, that the surfaces in all the serous cavities are provided with a covering of this description to facilitate motion and secrete a lubricating fluid. A cavity having such structures as the elastic cornea, the capsule of the crystalline lens, the iris, and the extremities of the ciliary processes exposed to the contact of the fluid aqueous humour without any serous covering, would present an anomalous example of organization contrary to all analogy; and the secretion of such a fluid as the aqueous humour from such structures, without the usual provision of a membranous envelopment, would be equally unusual, and contrary to the laws which govern organization. That a delicate membrane, apparently of the same nature as serous membranes, can be without difficulty demonstrated on the back of the iris, goes far to prove that the whole cavity is similarly provided, although, from the nature of the other structures entering into its formation, it is difficult to display it. The adhesions which take place between the margin of the pupil and the capsule of the crystalline lens, the mottled opacity on the back of the cornea, and the occasional secretion of purulent matter into the aqueous humour in inflammation, strengthen the conclusion that this cavity is thus organized, and this being

established, the occurrence of disease in it must of necessity be admitted.

Mr. Wardrop was, I believe, the first to direct attention to the fact, that the membrane lining the chambers of the aqueous humour is liable to inflammation, and that it undergoes changes peculiar to it in consequence of such inflammation. In his essays on the Morbid Anatomy of the Eye, there is a distinct chapter on the subject. Mr. Lawrence, Dr. Mackenzie, and Mr. Tyrrel, also treat of the disease; but I think that it is evident from their descriptions and observations that the existence of a distinct, insulated inflammation, confined to this membrane, and not implicating the cornea or iris, or extending to the rest of the eyeball, was not contemplated by them. Many of the cases given, and the appearances described, might be attributed to *corneitis*, *iritis*, or general inflammation of the whole eyeball; in all of which the membrane of the chamber of the aqueous humour is more or less affected. It therefore, perhaps, remains to be determined whether or not there is a form of inflammation, commencing at least in the membrane of the aqueous humour, and which is so peculiar in its symptoms, appearances, progress, and results, that it may be considered of distinct specific character without any stretch of nosological refinement. I have already said that I believe there is such a species, but I am of opinion that it is often difficult to establish its distinct specific character, or to avoid confounding it with *corneitis* not very conspicuously developed, or with *iritis* of mild character.

The inflammation of the membrane of the aqueous humour which I should feel most inclined to consider a distinct disease, and to be entitled to rank as a species, is often so brief in its attack, and so transient in its progress, that it sometimes has nearly passed away before the practitioner's attention is directed to it. The patient complains

of slight haziness of vision, especially when looking at the flame of a candle, which appears as if seen through glass rendered dim by breathing on it. There is slight pain or uneasiness, sometimes increased by motion of the eye, and sometimes accompanied by irritation of the conjunctiva. The sclerotic, on a close examination, is found to have acquired a pink tint near the circumference of the cornea, but distinct vessels are seldom seen in it, in the early stage at least, as in common inflammation of the eyeball. On comparing the affected eye with that not attacked, if the disease be confined to one only, the perfect transparency of the cornea and aqueous humour appears slightly impaired, and the colour of the iris, especially if it be a blue one, is less clear. The pupil does not dilate and contract as actively as usual, and it is often, even in the early stage, slightly irregular. Vision, except so far as it is impaired by the haziness, remains perfect both for near and distant objects. As the disease advances, the pupil becomes more inactive and irregular, does not dilate on the application of belladonna, and adhesions between its margin and the capsule of the lens are formed. The mottled opacity to which I have alluded in describing simple inflammation of the eye, as well as the syphilitic and serofulous forms, takes place in this also, but not unless it is protracted and severe. It has been considered a characteristic or diagnostic symptom of this species of disease, but it is not peculiar to it: it may occur in any case in which the membrane of the aqueous humour partakes of the general inflammation of the eyeball. In very severe and protracted cases the structure of the iris becomes engaged as well as its serous covering. Its pupillary margin assumes a brown or fleshy appearance, and the whole surface has its colour altered. This is the extent to which the disease appears to proceed. The capsule of the crystalline lens may become opaque at the points where the adhesions take place between it and

the margin of the pupil, but the disease does not extend, as the other inflammations, to the rest of the organ, or end in loss of vision by cataract or destruction of the retina. On the contrary, it seldom goes so far as I have described, and subsides in a short time, leaving behind it no other marks of inflammation than adhesions of the pupil, or the mottled opacity on the back of the cornea in a slight degree.

Of the consequences of inflammation of the membrane lining the chamber of the aqueous humour, there is not one more troublesome or disagreeable than the *muscae volitantes* which almost uniformly remain after the disease has passed away. They cause much alarm to the patient, and are sometimes so thick and numerous that they interfere with comfortable vision. They are not the transparent gyrations or strings of globules usually seen by persons having no disease of the eye; neither are they the fixed, dark, opaque dots, which may probably be referred to some minute and circumscribed disorganization of the retina, but resemble shreds of tangled silk of the finest texture, or minute fragments of cobweb connected with each other by the most delicate fibres. When the eye is fixed by steadily looking at some dark object, with a flood of light or a white surface behind it, as in viewing the top of a chimney against the sky, these *muscae* evidently descend, and appear to subside by their own gravity so as to become invisible; and when the eye is moved rapidly in a horizontal direction, they swing from side to side as if suspended in a fluid. Be the cause of these appearances what it may, or the place from which it operates ever so doubtful, the effect is obviously such as may be fairly attributed to the presence of some material more or less opaque in the field of vision; and I cannot but think that they may be fairly accounted for on the supposition that they are exceedingly minute substances, probably the consequence of inflamma-

tion, floating in the aqueous humour. Dr. Mackenzie, who must be considered good authority on such a point, however, appears to be convinced that these appearances are not due to any material interposed between the retina and external objects, and calls them "certain false visual sensations." "Patients," he observes, "are often persuaded that *muscæ volitantes* move, and will not readily be convinced that this is a deception. They will sometimes tell us, for instance, that when they raise their eyes rather quickly, the *muscæ volitantes* fly upwards, but if they fix their sight upon a cloud or other elevated object, that they descend slowly, as if towards the bottom of the eye; that they do not see them when they continue to look steadily at the same object; but that on the least motion of the eyes, the *muscæ* leave the situation which, from their gravity, they had assumed." This description is so often given by intelligent persons, and it accords so well with the apparent motion of the transparent *muscæ* so commonly observed by the majority of persons, that it cannot be considered due to false visual sensations, or to be suggested by any fleeting derangement of function of the retina. "These motions," he continues, "are merely apparent. Opaque spots in any part of the eye anterior to the retina could never produce an image on that membrane sufficiently defined to give rise to such impressions as the generality of *muscæ volitantes*." Optical principles may, perhaps, justify this assumption, but it cannot be admitted that they warrant so positive a conclusion. The refracting media of the eye are far too complicated, and the curves of its lenses have been so imperfectly ascertained, that we cannot deny thus the possibility of such an impression on the retina from opaque material in the place through which light is transmitted. This is not, however, the appropriate occasion for discussing this point, and I will not, therefore, venture to say more on the subject than to express my

present belief that these *museæ* are really minute opaque films, or delicate fibres floating in a fluid, and probably in the aqueous humour. Be their nature what it may, these *museæ* are remarkably permanent, continuing for years after the inflammation which caused them has passed away, or even during life; and they are unaccompanied by any defect of vision, except what depends upon their momentary interposition between an object and the retina. They cause much annoyance and alarm, but the sight remains good both for near and distant objects, notwithstanding their troublesome interference in particular positions of the eye or the object. The practitioner may therefore often relieve the anxiety and apprehensions of patients respecting them by explaining that, although they may not be removed, they are not necessarily symptomatic of destructive disease. He must, however, observe caution in this respect, because such *museæ* are amongst the early symptoms of slow and insidious forms of inflammation of the eye, which sooner or later involve the retina, and terminate in amaurosis, or, in other words, in defective vision or blindness from loss of sensibility of the retina.

This inflammation of the membrane of the chamber of the aqueous humour appears to be caused by exposure to cold, and sudden transitions from high to low temperature, the system being at the same time in a state disposing to such local inflammations. Persons labouring under the rheumatic or arthritic diathesis appear to be more liable to it, and still more those who have the vigour of the constitution impaired by defective nutrition or inordinate secretions. I have seen it more frequently in young men and women than in children or aged persons, and in them oftener where the strength or tone of the frame is not conspicuous, and where the body is more under the influence of impressions on the nervous system. Young women, from the period of puberty to the age of twenty or five-and-

twenty, appear, perhaps, to be more liable to it than others; but men of comparatively vigorous constitutions, predisposed to gout, or liable to attacks of rheumatism, also suffer from it. Persons sitting and sleeping in the warm apartments of comfortable houses, and called on to expose themselves suddenly to the inclemencies of the weather, are often subject to brief attacks of muscular rheumatism, and in such this inflammation of the eye also occurs, but sometimes of so transient a character that it disappears almost as soon as it is perceived, leaving no evidence of its existence except the *museæ* above noticed. There is some aching pain, and even pain on motion of the eyeball, and sensation of a foreign body on the conjunctiva, but in so slight a degree that the patient scarcely notices it, and when subsequently questioned on the subject, will seldom admit that there has been any inflammatory action. I have often been astonished at hearing the most positive denial of the previous existence of any pain, redness, or defective vision, in cases where the most extensive adhesions of the margin of the pupil to the capsule of the lens, with a profusion of the floating *museæ*, were present.

To the extent, duration, progress, and consequences of the disease, I have already directed attention in the preceding remarks. It is necessary, however, to add, that the disease seldom proceeds beyond the formation of adhesions of the margin of the pupil to the capsule of the lens, or the production of the speckled opacity on the back of the cornea which occurs in other forms of disease. Purulent matter is not effused into the anterior chamber, as in inflammation from injury or irritable ulcer of the cornea, or from severe iritis; neither does the structure of the iris become engaged in any considerable degree, or exhibit any traces of effusion of lymph. I have, however, sometimes seen this part undergo changes of colour in this disease, and sometimes assume a peculiar fleshy appearance

when the inflammation is protracted. The retina or other structures of the eye do not appear to be implicated, and vision is not impaired, except so far as it is affected by the loss of transparency in the chamber of the aqueous humour. Even the sclerotic displays but an inconsiderable degree of increased vascularity. In fact, when these parts become engaged in any considerable degree, the disease ceases to be entitled to the character of a distinct specific inflammation, and becomes general inflammation of the eyeball. The duration of inflammation confined to the membrane lining the chamber of the aqueous humour is, as I have already observed, generally very brief: sometimes not more than a few days. It occasionally, however, is more slow in its progress, and more protracted. It is also liable to return or relapse. The consequences which remain after all inflammation has passed away are, the *muscæ* above noticed, which generally continue for months or years, or even during the remainder of life, and adhesions of the margin of the pupil to the capsule of the lens. The peculiar speckled opacity on the back of the cornea is also found for some time after the disease has ceased, but I believe it generally ultimately disappears.

The treatment of this form of inflammation should be conducted with due regard to the state of the system and the predisposing causes. When occurring in men of vigorous constitution predisposed to gout or rheumatism, or occasionally suffering from transient attacks of the latter disease from exposure to cold, it may be treated more freely by depletion. Bleeding from the temple and cupping may be resorted to; and antimonial medicine, if not to cause nausea, at least to operate as a diaphoretic, may be administered. Mercury, as in other forms of inflammation of the eye, must be given, if the inflammation does not yield at once, and must be continued in the usual way, and for the usual period, until the disease is subdued. If

proofs of the existence of the gouty or rheumatic diathesis exist, colchicum may be found useful, with the foot-bath, and other remedies suited to cases so modified. Turpentine may also prove a valuable resource. If, however, as more frequently happens, the disease takes place in persons of less vigorous constitution, in whom the circulation is languid and the nutritive function less active, depletion is not only ineligible, but pernicious. The causes which have led to the feeble state of the frame, which has probably predisposed to the disease, should be carefully ascertained, and, if possible, as carefully removed. Nutritious food, which, in persons of more vigorous health, must perhaps be denied, in those of less bodily strength must be supplied. In no case is the common error, that inflammation is always to be treated by arresting nutrition, so conspicuously exposed as in the treatment of such inflammation as that now under consideration by depletion and deprivation of sufficiently nutritious food. I am convinced that such practice frequently exasperates the disease, and promotes the progress of destructive changes in organization. Bark or quinine, iodine, and iron, must be put in requisition in the treatment of this disease, and generally earlier than in other forms of inflammation of the eye. In persons of feeble frame, languid pulse, and pallid skin, tonics must be resorted to at almost the very commencement, and if a true serofulous diathesis exists, iodine must speedily be added. If the attack be sudden and transient, there may not appear a necessity for active or regular treatment, but recollecting that the inflammation is modified, if not induced, by constitutional derangement, and that it is liable to return, remedies calculated to correct such derangement should be administered, and persevered in, even after the disappearance of the local symptoms. Whether it be rheumatism or serofula, the pernicious influence must, if possible, be counteracted, and the general health of the

system, if possible, restored. As in other cases of inflammation of the eye not requiring very active treatment, I begin with small doses of mercury, combined with antimony, laying aside the latter after a day or two, and continuing the mercury alone until some evidence of its presence in the system is afforded, or until a period has elapsed sufficient to admit of its absorption. I give generally to adults three grains of the *pilula hydrargyri* with about a tenth of the tartrate of antimony three times a day, for three days, and then the same quantity of the pill alone, for about a week longer; when, if the case be one not suited to full mercurial influence, or requiring its being persevered in to the production of ptyalism, I keep up its action by the administration of five grains of the same pill every night, giving bark or quinine, iodine or colchicum, during the day, according to the state of the disease, or the constitution. I do not, however, lay this down as a rule. Every practitioner has his own views and practice as to the administration of mercury. All I wish to inculcate is the expediency of proceeding cautiously in the matter, and recollecting that mercury is not incompatible with tonic or other constitutional remedies.

As to local applications, little is required in that way, or is even to be permitted. Either cold or warm lotions or stupes cause reaction, and probably increase the local vascular turgescence, and the weight or pressure of any form of dressing produces uneasiness and irritation. It will, however, be necessary to cause dilatation of the pupil, to prevent adhesions, or to stretch or break them if formed. With this view, a daily painting over of the lids or brow with good extract of belladonna will answer the purpose during the early or inflammatory stage, and afterwards a drop of solution of nitrate of atropia, in the strength of about two grains to the ounce of water, may be put between the lids every morning. It irritates less, and is perhaps

more powerful than the simple solution of extract of belladonna, but if not at hand, a watery solution of the extract, from which the insoluble part has fallen, may be substituted. It may here be asked whether or not it really happens that adhesions formed between the margin of the pupil and the capsule of the crystalline lens are actually broken by the dilatation of the pupil under the influence of atropia. Such a consequence appears very probable from the obvious nature of the effects, but it should be settled whether or not it follows. The truth is, that these adhesions are generally much too strong and extensive to admit of rupture in this way, but they are sometimes so minute that they really break. I have undoubtedly seen them yield, and observed great improvement in vision in consequence, but such cases are rare. When a patient applies, long after the inflammation has passed away, with irregular and adherent pupil, the remedy should be applied, if for nothing else, to ascertain the extent of the mischief, and should be continued for some time, and with occasional intermissions, to cause, if possible, rupture or elongation of the attachments. In this variety of inflammation of the eye blisters appear to be of more advantage than in those where the inflammatory action is more intense. In all cases, in fact, counter-irritants appear to be of more benefit where the local disease is transient or of brief existence, or when it is of rheumatic or neuralgic character. I think I have often seen incipient inflammation of the eye, returning after a long intermission, or of the nature of relapse, arrested by the application of a blister or sinapism to the temple; and in the species now under consideration they appear to be particularly useful.

In concluding these observations, it is right to observe that this disease, which has been now under consideration, appears to have been more distinctly distinguished by the late Mr. Tyrrel than other writers, and the treatment directed

to the improvement of general health and removal of constitutional derangement more carefully inculcated. Indeed, the value of general treatment and medicinal remedies to invigorate the system, or, as he expresses it, "to support the general power," appears to have been more justly appreciated by him than other practitioners. In the first volume of his work on Diseases of the Eye, there is a chapter on this disease which, in a brief way, embodies the doctrines which I have been endeavouring to inculcate respecting it.

ON INFLAMMATION OF THE RETINA.

THAT inflammation of the retina may take place, as well as of any of the other component structures of the eye, will readily be admitted; and that it does take place practical observation proves. It is not, however, so apparent that the form, species, or modification of inflammation to which the term *Retinitis* should be restricted, is well understood or recognized. In all inflammations of the eyeball, the retina is engaged and suffers accordingly; vision being sometimes lost entirely, and at other times greatly impaired. In iritis, from whatever cause, we every day see total blindness or great defect of sight as a consequence of the disease; the cornea and crystalline lens remaining transparent, and the pupil open; which can scarcely be attributed to any other cause than disorganization of the retina by the inflammatory action. Such inflammation of the retina is not, however, that which is alluded to or indicated by writers when they treat of retinitis or that form of disease which they consider entitled to be considered of this distinct specific character. It is a violent attack of inflammation which appears to commence in the deeper seated parts of the eye, but which speedily extends to all

the other parts of the organ. Dr. Mackenzie, in his work on Diseases of the Eye, thus describes it:—

“By *acute retinitis*, I mean a violent inflammation of the internal textures of the eyeball, identical with the *ophthalmia interna idiopathica* of Beer, and the *ophthalmitis phlegmonosa* or *ocular phlegmon* of others.

“*Stages*.—We may distinguish three stages in the progress of this disease. 1. The stage of photopsia, extending from the beginning of the disease till the time when the retina becomes insensible, and the eye ceases to be photophobic. 2. The stage of suppuration, counting from the cessation of photophobia. 3. The stage of spontaneous rupture, an event which rarely occurs when the disease is idiopathic, although not unfrequent in traumatic cases.

“*Symptoms*.—The patient complains of a general feeling of pressure and tension in the whole eyeball. To this there succeeds an obtuse, deep-seated, pulsating pain, which soon extends to the eyebrow and cranium. The power of vision rapidly declines. The pupil is observed to have lost its blackness, and, according to Beer, it becomes much contracted. Without becoming angular or deviating from its natural situation, it at length completely closes, the iris having reached its greatest possible degree of expansion, and seeming no longer to be perforated by any central opening. Mr. Lawrence, however, relates a case, which he considers one of retinitis, in which the pupil was slightly dilated. Beer states that long before the pupil is closed, the sensibility of the retina seems extinct; and yet even when the pupil is closed, and there is no longer any trace of perception of light from without, the patient experiences a troublesome sensation of fiery spectra with every oscillation of the internal bloodvessels of the eye.

“While these changes are taking place, the iris loses its natural colour, becoming greenish or reddish according to its original hue. The anterior chamber is strikingly dimi-

nished in size, the iris having advanced towards the cornea. By the time that this projection of the iris is discerned, which is generally when the pupil is still of considerable size, the whole sclerotica is rose-red. The conjunctiva some time after, presents a pretty thick network of blood-vessels, and the cornea loses much of its natural lustre. There is now severe inflammatory sympathetic fever, along with insufferable and almost maddening headache. Sometimes it happens that during this period of the disease, the pupil, though much contracted, does not completely close ; but it is cloudy, and, on looking at it through a magnifying glass, or even by merely concentrating the light upon it, it is seen to be of a reddish-gray colour.

“ So severe are the sympathetic fever and headache which attend acute retinitis, that it sometimes passes with medical men, who have not studied the diseases of the eye, for phrenitis or brain fever, the characteristic symptoms of the ophthalmia, from which the affection of all the other parts arises, not being sufficiently prominent to arrest attention.

“ The pain of the eye now becomes unequal ; it is still pulsative, but is attended by a feeling of cold and weight in the part. Shiverings take place, and there suddenly appears a quantity of pus at the bottom of the anterior chamber. The matter presents a horizontal surface, and is sometimes seen to change its position, on the head being moved from side to side. It constantly increases in quantity till it not only reaches the pupil, but at length fairly fills the anterior chamber. It may accumulate to such a degree, especially in neglected cases, that the cornea projects, assumes the appearance of an abscess ready to burst, and at last gives way under insufferable pain. In some instances, the matter formed within the eye makes its way through the sclerotica, leaving the cornea and anterior chamber entire. After the matter is evacuated, the eye collapses, and the pain gradually subsides.

“ If the pupil has not completely closed by the end of the first stage, we see, just at the moment when the hypopium begins to form, fine whitish filaments of lymph shooting from the edge of the pupil towards its centre. Viewed through a good lens, these have the appearance of a delicate cobweb. After the pus has covered the pupil, and remained perhaps long unabsorbed, this cobweb-like pseudo-membrane becomes whitish-yellow from little particles of the pus lodging in its interstices, and sometimes a single piece of what appears to be thickened purulent matter, attached to this membrane, projects through the pupil, intimately connected also with the pupillary edge of the iris. This is seen after the greater part of the purulent effusion is absorbed ; but if the pupil has closed completely in the first stage, of course nothing of this spurious cataract is observed.

“ Retinitis does not necessarily go the length of suppuration. It may be arrested after the pupil has closed, and the retina become insensible. In this case, the eye falls into the varicose state, and ultimately becomes atrophic.”

Believing, as I do, that it is of great importance that retinitis or inflammation of the retina should be clearly understood and distinguished, I think that it is better to consider the form of violent inflammation here described under a different title. In such a case as this, although the retina is engaged from the commencement of the attack, the whole eyeball is affected, which is not an unusual occurrence. In the other inflammations of the eyeball, usually called iritis, the same frequently, if not generally, takes place, and then the disease is said to commence with amaurotic symptoms. If such is to be described as a distinct form of inflammation, it will perhaps be better to call it *ophthalmia interna*, as it appears it has been by Beer, reserving the term retinitis for a species of inflammation better entitled to the denomination. Mr. Lawrence, in his

Treatise on Diseases of the Eye, records several cases of retinitis, or inflammation of the retina, which did not present any of the formidable symptoms supposed to belong to this form of disease. "A faint and scarcely perceptible pink tint was observed in the sclerotica near the cornea" in one of them; in another, there was "slight redness of the sclerotic;" in a third, there were "a few red vessels in the sclerotic;" while in a fourth, which seemed to afford the most decisive proofs of the existence of inflammatory action, "the iris was partially discoloured, and its pupillary margin adhered at two points to the capsule." In one case in which vision was lost, and great pain, with intolerance of light, followed, from a flash of lightning, there was "no redness, nor any unusual appearance of the eye:" and in another, where vision became almost extinct from the same cause, with sense of heat in the eyeball and tenderness on pressure, there was "no increased redness nor any change in the transparent media." Mr. Lawrence adds, that "a considerable proportion of the cases included under the head of *amaurosis*, are affections of the retina, states of congestion, chronic inflammation, or functional disorder;" and this is the true state of the case. It is, in fact, under the head of *amaurosis* that we have that inflammation of the retina described to which the term retinitis should be restricted. It is under that title it has been considered by Mr. Lawrence, and under that I myself treated of it in the article "*Amaurosis*" of the *Cyclopædia of Practical Medicine* in 1832. Entertaining, as I do, the same views on the subject which I then expressed, I here copy that portion of the article:—

"That *amaurosis*, or to speak more plainly, defective vision, must attend inflammation of the retina is obvious; it is, in fact, the symptom, not the disease; and therefore the subject of inflammation of the retina must receive distinct consideration. The first question to be settled is,

whether inflammation of the retina ever exists perfectly insulated, and without involving the neighbouring structures ; or whether inflammation of the other parts of the globe of the eye, as the iris or choroid, ever occurs without involving the retina. This is a question of some difficulty. The functions of the retina are so frequently impaired from iritis, both during the existence of inflammation and after it subsides, that the extension of the inflammation from one to the other, or their coëxistence in both, must be admitted ; and therefore the general adoption of the term iritis, and its frequent application to inflammation of all the contents of the eyeball, has proved most injurious, by directing the attention of the practitioner to the state of the iris exclusively, and placing out of view the retina, which, from its greater delicacy, and from its integrity being so much more essential to vision, should be an object of greater anxiety. It is not denied that iritis does occur without corresponding inflammation of the retina ; but it is certain that they are both frequently engaged, and that the disease, in such cases is, general inflammation of the eyeball, or internal ophthalmia.

“ Mr. Travers says, in his Synopsis of Diseases of the Eye, p. 137, that ‘ the retina is sometimes, though rarely, the seat of inflammation ; but it is an error to suppose that intolerance of light is a sign of this affection, as is clearly proved in the strumous ophthalmia, in which, though the intolerance is in excess, the retina is uninjured ; and secondly, because the effect of inflammation upon a nerve of sense is to produce palsy, not increased excitability.’ That intolerance of light is not necessarily a symptom of inflamed retina may be admitted, but it is not proved that the effect of inflammation is to produce palsy of a nerve of sense.

“ The causes of inflammation of the retina are as various as those of general inflammation of the eyeball. The dis-

case may arise from gout, rheumatism, syphilis, mereury, or typhus fever ; or it may be idiopathic, without assignable cause. Mr. Lawrence appears to consider every form of amaurosis to arise from inflammation. He says, ‘ Amaurosis, in its most frequent and important form, that which is seated in the eye itself, is generally inflammation of the nervous structure ; including, under that phrase, all degrees of increased vascular activity, whether designated as fulness, turgescence, determination, congestion, or as inflammation in its most limited sense ; and the usual result of inflammatory disturbance, that is, organic change, permanently destroying the function of the part.’

“Mr. Travers describes the symptoms of inflammation of the retina as follows :—‘ The first and predominant symptom of inflamed retina—viz., a sudden attack of vehement dashing pain of the most distracting kind, which is described to extend from the bottom of the eyeball to the occiput, or in the reverse direction, and the supervention within a few hours of total blindness, with occasional sparks and flashes of vivid light.’ ‘ The pupil, upon inspection, is gaping and motionless, as in confirmed amaurosis, and the humours are thick and muddy.’ Mr. Wardrop observes that, ‘ when the retina is affected with inflammation, the disease is marked by painful vision, intolerance of light, sparks of fire or drops of a red colour falling before the eyes, little external redness, pain darting through the head, with more or less constitutional derangement.’ To suppose that inflammation of the retina is always accompanied by those violent symptoms would be dangerous in practice. The disease is often mild and insidious in its approaches, and marked more by defective vision than by symptoms of inflammation. The first care of a practitioner on approaching a person complaining of defective vision of recent occurrence, is, to ascertain whether there be any evidence of the existence of inflammatory action in the re-

tina. The symptoms may often fail to satisfy him; there may be no pain, no morbid sensibility to light, no headache. The state of the pupil is no guide, as it is affected, more or less, in almost every form of amaurosis. The form or nature of the *spectra*, or *muscæ volitantes*, does not enable him to pronounce with certainty. The difficulty is, however, frequently removed by careful inspection of the state of the sclerotic coat. The arterial inflammatory vascularity of the sclerotic has always afforded a characteristic symptom of internal inflammation of the eyeball, and has been dwelt upon with emphasis by Mr. Saunders, and subsequent writers. The red vessels converging towards the anterior part of the eyeball, in distinct lines, and forming by their delicate subdivision into minute branches a bright red zone round the circumference of the cornea, is always pointed out to the student as an appearance indicative of internal inflammation, and a uniform accompaniment of iritis. This appearance often, perhaps always, in a greater or less degree, accompanies inflammation of the retina; and when attended by defective vision, and complaint of a film or gauze before the eye, should probably be considered conclusive evidence of the nature of the disease.

“The treatment of inflammation of the retina must embrace the means usually adopted to remove or restrain inflammatory action, modified and proportioned to the nature, peculiarity, and intensity of the disease in each individual case. Such are, general bleeding, leeching, and cupping, nauseating and purgative medicines, mercury, and blisters. When the attack is accompanied by the intense and alarming symptoms just now enumerated, on the authority of Mr. Travers, the adoption of a vigorous plan of depletion is obviously demanded, and general and local bleeding indicated; recollecting, however, that we should not be too sanguine as to the result, or place too much confidence on these resources, unassisted by other means.

Daily experience proves how unavailing mere depletion is found in iritis, or general internal inflammation, and even how unsuited to particular cases, however intense the symptoms. The value of mereury in the treatment of internal inflammation of the eye in general, and of inflammation of the iris in particular, is now so fully appreciated that no argument need be employed to induce the practitioner to give it a fair consideration. Mr. Travers makes the following observations respecting its administration: 'When the amaurosis is recent and sudden, and either the signs of an obscure inflammation are present, or only the amplitude and inactivity of the pupil correspond to the patient's history, the indication is less simple; mercury should be introduced with all convenient rapidity into the system, I mean so as to ruffle in the least possible degree. No advantage is obtained by salivation; on the contrary, I think it hurtful. When mercury is beneficial, its efficacy is perceived as soon as the mouth is sore. I have seen it tried, and have myself tried it in many cases of amaurosis, without the smallest advantage: but in cases of recent occurrence, imperfect, but rapidly progressive from bad to worse, I have been witness to its power in suddenly arresting the disease in too many instances not to entertain a far higher opinion of it than of any other article of the *materia medica*.' Mr. Lawrence, who, we have already said, appears to consider the majority of cases of amaurosis to arise from inflammatory action, sums up the treatment as follows:—'Our object is to put a stop to vascular excitement, to prevent the permanent injury of altered structure and impaired function in a structure the peculiar delicacy of which particularly exposes it to such danger. We must therefore employ antiphlogistic treatment of a decided character, and follow it up with a decision and steadiness commensurate with the importance of the affected organ: under the head of antiphlogistic

treatment, must be included general and local bloodletting, but more particularly the latter, as, by cupping from the back of the neck or the temples, or by the application of leeches, the evacuation of the bowels by purgatives, and a restricted diet. Repose of the organ should be observed, more or less complete, according to the nature of the case; counter-irritation by blisters, from which a discharge may be kept up by irritating dressings: these are the means suitable to the early stage of the affection, the stage of excitement; but if this treatment be not found to remove the change which has been produced in the retina, we must have recourse to mercury, which appears to be as decidedly beneficial in these cases as in iritis, or general internal inflammation. The remark which I made respecting the use of mercury in those affections, applies also to the present case—namely, that its good effect mainly depends on the promptitude with which it is employed. The alterative form is insufficient; we give it with the view of arresting inflammation in the structure, which is the very seat of vision; that structure is easily changed by the inflammatory process; our only remedy is to push the mercury in a decided manner, and if we do so, we shall put a stop to the affection. We have used mercury very freely for amaurosis; we have used it until profuse salivation has been produced, and many decided instances of the good effect of this practice have come under our observation.'

“The practitioner has other resources than those above mentioned. Internal inflammation of the eye yields often to remedies of very different character; and inflammation of the retina forms part of that disease. Cases may occur where general depletion is inadmissible. Old and debilitated females, scrofulous subjects, persons already weakened by disease, poverty, or confinement in ill-ventilated apartments, or who have, perhaps, just gone through a mercurial course, evidently would not derive relief from

such treatment; on the contrary, they would require a tonic plan of treatment, with the free administration of bark and generous diet. If inflammation of the iris be arrested or restrained by the administration of turpentine, as stated by Mr. Hugh Carmichael, and it seems agreed that in certain cases, probably of peculiar character, it is a valuable remedy, it should constitute one of the resources in inflamed retina. Should the inflammation occur in a gouty or rheumatic habit, or alternate with affections of the joints, or other symptoms of these diseases, the treatment must be modified accordingly, and advantage taken of the resources which medicine affords in such cases. Colchicum, under such circumstances, has been resorted to with some advantage. The eye should be protected from the irritation of strong light; but total darkness is unnecessary, and is probably pernicious, by increasing the sensibility of the retina. Care should be taken that, in excluding light, the free circulation of fresh air round the patient should not be interrupted. No circumstance has contributed more to the want of success in cases of this description, than confinement of the patient to the respiration of an atmosphere contaminated by human effluvia.

“It is reasonable to believe, that during the inflammation of the retina, vision is impaired by those changes which uniformly accompany inflammation, as increased vascularity, and excited or altered sensibility; while the effects or consequences, such as enlargement of vessels, and thickening or disorganization of structure, remain after inflammatory action has subsided. These two states present as remarkable a difference in character as the acutely inflamed conjunctiva, and the vascular and altered condition heretofore denominated the chronic stage of that disease. In practice this distinction must never be lost sight of, because the treatment of an inflamed retina must be very different from that of a retina which has formerly suffered from inflam-

mation. The practitioner, therefore, has first to ascertain whether the case before him be actual existing inflammation of the retina, or disorganization produced by inflammation.

“Cases of amaurosis from disorganization of the retina are of frequent occurrence, because this state of the eye is produced by every form of internal inflammation. The patient complains of defective vision, under all circumstances: he can read with difficulty, for he can only distinguish the larger letters; he sees the general outline of objects, or the more remarkable appearances in form or colour, but he cannot distinguish the features of those near him, or recognize his acquaintances. A film or mote of precise unvarying form appears to float before the eye, and frequently a uniform cloud or mist interrupts vision. A lighted candle appears as if seen through a mist, or is surrounded by a halo. These are a few of the symptoms of which the patient complains; many others of the same description are occasionally observed.

“On looking into the eye in such cases, the pupil may appear perfectly transparent; the iris may be capable of acting, though sluggishly; and the cornea and sclerotic may be in an apparently healthy state. On a closer inspection, a slight irregularity of the pupil may be observed, which becomes more remarkable upon shading the eye from the light, and still more upon dilating the pupil with belladonna, when an adhesion of the margin of the pupil to the capsule of the lens at one or two points becomes visible.

“Where this little brown string of adhesion is attached to the capsule, a slight opacity of that part may be observed. This is the slightest degree of actual change of structure to be observed in those cases; in other examples the disorganization is much more obvious. If the eye has suffered from severer internal inflammation, the entire margin of the contracted pupil adheres; causing a circle of white opacity

at the place of adhesion, and leaving a central portion of the capsule and lens transparent, and capable of transmitting the rays of light to the retina. If the previous inflammation has been still more destructive in its consequences, the pupil is much contracted, or even completely closed, and adhering to the capsule of the lens, which is opaque; constituting capsular, and probably lenticular cataract. The existence of the cataract does not alter the case as regards the retina; it is still, partially or wholly, insensible to light, as is often proved by the want of success in operations for cataract in such cases: and this very state of the eye should make the operator cautious in his prognosis as to the result of an operation, as in such cases the cataract may be removed, and yet no vision follow, on account of the disorganization of the retina. The sclerotic coat frequently presents, in such cases, a livid vascularity, with large veins ramifying through it in every direction; and in the worst cases the shape of the globe is altered, and the sclerotic is projected or stretched into a staphylomatous tumour, or depressed into hollows by the action of the muscles. This state of eyeball is highly characteristic of the completely unsound retina, and proves the hopeless nature of the disease.

“In considering the treatment of amaurosis, or impaired vision, the consequence of internal inflammation, the first question to be determined is, whether the treatment adopted in the inflammatory stage be applicable to this; recollecting that the state of the eye now under consideration is a consequence observed many months, or even years, after the cause has subsided. The doubts respecting the state of the retina, and the treatment of its diseases, arise from the impossibility of seeing the alterations in its structure. Opacities of the cornea, and enlarged vessels of the conjunctiva, are visible after the inflammatory stage of purulent ophthalmia has passed away; and the practitioner is

therefore satisfied that he cannot remove them by a repetition of the depletion which he first adopted. If the thickness and vascularity, which probably exist in the retina, were equally visible, he would also despair of removing them by his first plan of treatment. Abstraction of blood may be advantageous in full plethoric habits, to relieve a turgid state of vessels already permanently enlarged; but it should not be resorted to with the view of removing inflammatory action, which no longer exists. Mercury is frequently administered in these cases, and apparently because it has been found advantageous in the inflammatory stage. If mercury be of any use in such cases, it is by promoting absorption of lymph, or other deposit found during inflammation; it is not, however, found to effect such objects in cases where deposits, or thickenings, are obvious to the eye, as in opacities of the cornea, or in closed pupil, and therefore probably possesses no such power here. At all events, mercury should not be indiscriminately resorted to, and a guarded prognosis of the result of its administration should be made. To rouse the activity of the impaired function, or to raise the sensibility blunted by disorganization, impressions on the extremities of the fifth pair of nerves may be advantageously resorted to; hence the practice of repeated blistering all round the orbit, or of applying stimulating liniments, or sinapisms, in the same situation. With the same view, sternutatories may assist; and perhaps, in certain cases, electricity.

“Amaurosis is sometimes caused by hæmorrhage, as well as by a general plethoric state of the vascular system; but it is difficult to determine why this happens in some cases only. Hæmorrhage occurs every day, and yet blindness from this cause is rare. Amaurosis is not by any means a constant, perhaps not a frequent symptom of general plethora, or that state termed a determination of

blood to the head. Whatever may be the condition of the arterial capillaries of the retina when the action of the heart is suspended, interrupted, or greatly weakened, blindness is not a necessary consequence; it does not occur in bleeding, unless faintness be produced; it does not attend extreme weakness, with imperceptible pulse, preceding death; nor is it a consequence of the application of a ligature on the carotid, which restrains hæmorrhage or cures aneurism. On the other hand, whatever may be the state of the venous capillaries of the retina, during a turgid or obstructed state of the venous circulation, blindness is not found to be a consequence of temporary pressure of the jugular veins, or of accumulation of blood in the right side of the heart, from disease of the heart or lungs. These considerations are important in a practical point of view; upon them the practitioner founds his estimation of the degree of value of a system of depletion, or the opposite plan of invigorating or increasing the activity of the vascular system.

“The first care of the practitioner in cases of defective vision, without apparent inflammation or disorganization of the retina, is to ascertain, as far as symptoms admit, whether there be reason to suspect increased arterial or obstructed venous vascularity. The amaurotic symptoms afford no satisfactory evidence upon the subject. The information must be derived from the appearance of the patient, or the existence of undue vascular action elsewhere, turgidity of the vessels on the surface, especially those visible in the conjunctiva or sclerotic, throbbing of the arteries of the head, or fulness of the jugular veins. Mr. Mackenzie, in his *Treatise on the Diseases of the Eye*, says, ‘It has been mentioned that plethoric persons are in general able to produce a degree of congestive amaurosis at will, by stooping, tying their neckcloth tight, and the like. We also frequently witness a temporary amaurosis from exhaustion. For instance, if the nervous system is the

seat of no particular excitement at the time, we observe that by the sudden abstraction of blood, the organs of vision, and indeed all the organs of sense, are strikingly enfeebled. In some individuals the debility continues for several days, and if any one of the organs of sense has been previously weaker than the rest, the feebleness of that organ is generally increased by bloodletting. When syncope is produced by loss of blood, sight appears to be the sense which fails first, and which recovers last. Hearing is next, while smell, taste, and touch, are less affected, and more easily reanimated by excitation. They return in a very short time to their natural state ; but it is not so with sight. It is a popular opinion that bloodletting weakens the sight, and, to a certain length, the opinion is founded in fact.' This view may be contrasted with that in the preceding paragraphs ; but whatever doubt may be entertained respecting the effect of particular states of the vascular system or vision, there can be none in practice as to the propriety of removing, if possible, a turgid state of the vessels, in persons suffering from amaurosis.

“If, therefore, a person complains of defective vision, with those symptoms which indicate vascular turgescence, the cause of this turgescence must, if possible, be ascertained. If the countenance is bloated and purple, and the conjunctiva full of large veins, and there is difficult respiration with other symptoms of disease of the heart or lungs, the cause is obvious. Such cases are of daily occurrence, and in the indications of treatment the removal of that cause must not be overlooked ; or, if it cannot be removed, the prognosis must be regulated accordingly. But if no such existing disease be obvious, and yet defective vision with symptoms of vascular turgescence be present, that symptom must be combated by the usual means ; as bloodletting local and general, blisters or sinapisms behind the ears as counter-irritants, or a seton in the neck

as a permanent discharge, sponging the forehead and head with cold water, or using the shower-bath. The bowels should of course be emptied, and all future accumulation there prevented, and the functions of the stomach and liver preserved in a state of perfection. Abstemious diet, exercise in the open air, alterations in habits, and every other plan calculated to improve the general health, should of course be enjoined. In the application of this plan of treatment, the following observations of Mr. Travers deserve attention:—‘A loss of balance in the sanguiferous system, occasioning an undue determination of blood to the head, often exists distinct from general plethora, and is aggravated by loss of blood. Cases of undue determination of blood to the organ are especially common after deep-seated chronic inflammation, or distress from over excitement, by which vessels have lost their tone; an effect decidedly increased by depletion.’

In addition to the preceding observations, it is necessary to offer here more precise descriptions respecting the nature and symptoms of inflammation of the retina and more careful instruction respecting its treatment, considering it apart as well from general inflammation of the eyeball, as from amaurosis. The most important fact to be established for the guidance of the practitioner is that of the occurrence of inflammation of this one particular membrane of the eye, without accompanying inflammation of the other parts of the organ. Irrespective of observation, the possibility at least of such an occurrence may be inferred from the circumstance of this structure deriving its supply of blood from a vessel having little if any communication with those of the other textures after its entrance into the optic nerve, except the vitreous humour and capsule of the lens. Supplied with blood by its central artery exclusively, it appears to be so insulated, as regards

its vascularity, that it may well be considered liable to inflammation, without coëxisting inflammation of the parts with which it is in contact. But observation establishes the fact of the occurrence of this insulated inflammation conclusively. In many cases of general inflammation of the eyeball, defective vision, to be attributed to inflammation of the retina alone, takes place often some days before any redness of the sclerotic or alteration in the iris is visible, and in many cases in which vision is totally lost in consequence of retinitis, there is no symptom of inflammation visible externally. In the above extract I have said that inflammatory vascularity of the sclerotic "often, perhaps always, in a greater or less degree, accompanies inflammation of the retina," but this must not be understood to mean that conspicuous vascularity which accompanies iritis or corneitis, but an exceedingly delicate tint of redness, often scarcely visible. I would also have it clearly understood that the absence of such vascularity is no evidence of the absence of inflammation of the retina; on the contrary, I wish to impress upon the mind of the practitioner that inflammation of that structure may and does take place without the slightest appearance of inflammatory action in the sclerotic or iris, and consequently without any external visible symptom of so formidable a disease. This it is necessary to state emphatically, because there is a prevalent belief that inflammation of the retina may always be easily recognized from external appearances, a belief which has caused loss of sight, I believe I may say, to thousands. This erroneous view, along with the equally erroneous one, that the defect or loss of sight known by the vague name of amaurosis, is generally caused by derangement of the digestive organs, has, I am convinced, been the cause of more loss of vision than any other established error.

From what is here stated it follows that the symptoms of inflammation of the retina are to be sought for elsewhere

than in external appearances, and that this most destructive disease may, and often does, take place without any visible change in the exposed parts of the eye. There may, in fact, be most formidable changes in progress in this most delicate structure, while neither the sclerotic and iris, nor the cornea, membrane of the aqueous humour, or crystalline lens, display any alteration. If the practitioner expects to derive information as to the extent or progress of the disease from the amount of pain or intolerance of light he is equally disappointed. In some cases, perhaps, the proportion of them cannot be correctly stated, both these usual effects of inflammatory action in this organ are present ; but in many, if not the majority, they are not to be observed. This should be well understood, and as it is a fact that inflammation of the retina may take place without redness of the sclerotic or change in the iris, so is it that it may take place without pain or intolerance of light ; yet are all these generally enumerated among the symptoms of retinitis. The disease is in truth, on this account, insidious in its approaches, and unaccompanied by these the usual warnings of progress, is most dangerous and destructive ; throwing both patient and practitioner off their guard, and often causing no alarm until it has effected all the mischief of which it is capable. In fact it is difficult, in some cases, to detect any other evidence of its existence, except loss or defect of vision, and as this may take place from other causes, it affords no satisfactory means of diagnosis. In all cases of amaurosis, whether from cerebral disease, constitutional disturbance, or impaired function of some important organ, loss or defect of vision necessarily takes place, as it does in inflammation of the retina ; and cannot, therefore, be relied on alone as conclusive evidence of the existence of retinitis. Still this one symptom or effect must in many, or perhaps the majority of cases, be the principal, if not the only guide as to the nature and

extent of the disease. There may be no redness of the sclerotic, no change in the appearance of the iris, no loss of transparency in the cornea, chamber of the aqueous humour, or crystalline lens. The action of the pupil may not be impaired, or if it be feeble or slow, little instruction is derived from that circumstance, recollecting that such is frequently the state of this function in the ordinary condition of the organ uninfluenced by disease. At the same time neither pain nor intolerance of light may be present. The patient complains of defect or loss of sight, and little if anything else. He cannot read or tell the hour by his watch, and cannot find his way as he walks, or recognize those with whose appearance he has been familiar. All is indistinctness, obscurity, or utter darkness. At first the complaint is of a seum or haze, and finally of total blindness. To ascertain how far this alarming state of sight is owing to other causes than existing inflammation of the retina, or the consequences of inflammation now subdued, or which has subsided, inquiries are to be made as to the presence or previous occurrence of symptoms of disease of the brain or its membranes, or of the optic nerve at its origin or in its course within the head; and here again the practitioner is baffled; for it often happens, especially in rheumatic cases, that the same inflammatory action exists in the membranes of the brain and in the internal ear, causing a sense of heat and fulness in the head, with giddiness and buzzing or singing sounds, and even deafness. Such symptoms may, however, with a little care, be distinguished from the more formidable consequences of disorganization of the brain or its membranes. Loss of sight from softening of the brain, the pressure of a tumour, extravasation of blood, serous effusion, or enlarged vessels, seldom takes place without other consequences sufficiently marked and plain to enable the practitioner to trace them to their cause. When, therefore, a patient complains of defective

sight of a nature calculated to excite suspicions as to the existence of inflammatory action in the retina, most careful inquiry should be made as to what are, not inappropriately, called "head symptoms;" and if such be not present, it may reasonably be inferred that the disease is in the eye itself. There is, however, another source of difficulty towards the establishment of a correct diagnosis. Vision, it is well known, may be impaired or even totally lost, either permanently or for a limited time, without either cerebral disease or inflammation of the retina. This is what has been called functional amaurosis, and which it is often difficult to distinguish from amaurosis caused by inflammation, and especially when that inflammation is of languid character. Difficult, however, as it is, every care should be bestowed to arrive at correct diagnosis under such circumstances, because upon that will depend the treatment, and therefore the prospect of recovery.

If inflammation of the retina may and does occur without redness of the sclerotic, alteration in colour of the iris, irregularity in shape or loss of motion in the pupil, or without pain or intolerance of light; and that the practitioner has very little evidence of its existence beyond the alarming one of lost or defective vision, it becomes very desirable to obtain whatever other proof symptoms can afford of the presence of such a disease. This, to a limited extent, may be obtained by a careful inquiry as to the nature and amount of the ocular spectra or false perceptions which probably always accompany this inflammation. These are not the same as the peculiar appearances observed in inflammation of the membrane of the aqueous humour to which I formerly directed attention, the irregularly shaped shreds or films floating up and down, and from side to side, and hence called *muscæ volitantes*, but transient, undefined, luminous objects, described sometimes as bright clouds, and sometimes as stars, flashes, or

sparks, occurring both in day light and the darkness of night. There are also coloured spectra more defined in outline, such as any one can induce in the sound eye by looking for a short time at the sun and then closing the eyes. I do not mean to assert that the true *muscæ volitantes* are not observed in inflammation of the retina, because I believe they often are, especially when the inflammatory action extends to the anterior part of the eye; neither do I mean to assert that these luminous or coloured spectra are seen in inflammation of the retina only, for they are observed in functional amaurosis and defective vision from cerebral disease; what I wish to urge is, that these luminous vanishing spectra, or momentary corruscations, are symptomatic of inflamed or excited retina; and also, that true *muscæ volitantes* are observed when the retina is entirely free from disease and vision in its greatest perfection. It may be suggested that if the symptoms of inflammation are so few, and those few occurring in amaurosis from other causes also, no adequate evidence is adduced to show that the defective vision here alluded to is a consequence of inflammation at all; but this defective vision with luminous spectra has so often been observed to be followed by visible inflammation and its consequences, including cataract, adhering pupil, and even alteration in structure and form of the sclerotic and cornea, that no doubt can be entertained of its inflammatory nature. When consulted relative to recent and sudden loss of vision without conspicuous head symptoms, or evidence of causes producing functional amaurosis, I generally warn the practitioner to look out for inflammation of the whole eye, or, as it is generally called *iritis*, and the warning is often justified by the result. This, in fact, has been admitted by writers, when they describe inflammation of the eye as commencing with *amaurotic* symptoms.

The consequences or effects of inflammation of the re-

tina which we are so frequently called upon to treat, and which are generally considered forms or species of the group of diseases commonly described under the vague denomination of amaurosis, amply justify the conclusion that retinitis is the primary disease in these cases. In this country I think a large majority of those who have become permanently blind, or who have their vision greatly impaired in consequence of loss or defect of sensibility of the retina to light, have been reduced to that state by this cause. In other words, a large majority of the amaurotic patients who apply for relief present appearances evidently the result of inflammatory action. Abundance of cases there are of amaurosis from cerebral disease, and some of the unintelligible kind which we call functional, but much the greater number are from inflammation. This appears to be more particularly the case amongst the poor, and to this fact I would direct the attention of surgeons of hospitals and dispensaries in the provinces, because I every day see people who have become incurably blind without seeking medical relief until it was too late. The disease is so insidious in its approaches and progress, and is accompanied by so little of visible change or pain, that the sufferers from it are thrown off their guard, and scarcely think it necessary to submit to treatment, until compelled to do so from inability to pursue their usual avocations. The eyes of amaurotic patients blinded by inflammation commencing in the retina, will sometimes, months or years after the inflammation has subsided, present no appearance of its consequences, but in general these appearances are obvious enough. The sclerotic is often so altered in organization and diminished in density, that it allows the colour of the choroid to be seen beneath it ; and hence the dark patches or general blue tint of this membrane : it is also often pervaded by large veins, and sometimes is even misshapen. The iris may be altered in colour, paralytic,

and tremulous; and the pupil fixed in either a dilated or contracted state, or irregular and partially adhering to the capsule of the lens. Cataract is not an uncommon result of the disease; generally the light-blue lenticular species, which breaks up into a soft pulp under the needle, but sometimes of the semitransparent amber tint, which, with dilated pupil, presents the appearance commonly called glaucoma. The *muscæ volitantes* or spectra which are observed at this period are generally different from those occurring during the existence of the inflammatory action. The patient complains more of a permanent dark cloud or veil than the strings of floating shreds which are observed in inflammation of the membrane of the aqueous humour; and the luminous clouds or coloured vanishing spectra of the early stage are not so troublesome. The fixed black spot or spots, which do not float or descend when the eye moves, but remain motionless when it is fixed, and which therefore I consider to depend on circumscribed minute disorganization of the retina, are also sometimes present. When alluding to the nature and seat of *muscæ volitantes*, I overlooked an excellent description of them given by Mr. T. Wharton Jones in his *Manual of Ophthalmic Surgery*. I therefore introduce it here:—

“They are rarely seen in the axis of vision, but generally to one or other side, or above or below. The patient thus seeing them only by a side glance, finds it difficult to fix them in order to study their appearance. They move as the eye moves upwards and downwards, or from side to side; but besides this motion, which, as dependent on that of the eye, is merely apparent, the *muscæ* have a real motion of their own, and still more extensive than their apparent motion. Thus, if, from looking before him in a horizontal direction, the patient suddenly raises his eyes and fixes them on some object above the horizon, he observes

that the muscæ fly upwards considerably beyond that degree of elevation, and even beyond the field of view, and then come sailing down before him till they disappear below.

“ Besides the motions of ascent and descent, the muscæ volitantes under consideration present lateral movements, although less marked, as well as changes in the relative positions of their several parts.

“ *Nature of floating muscæ.*—Hitherto a very common opinion as to the nature of floating muscæ has been, that they are subjective sensations, depending on some intrinsic change of state of the optic nervous apparatus, thus confounding them with fixed muscæ, but that they are truly objective sensations, occasioned by the presence of particles in the interior of the eye, but extrinsic and in front of the retina, throwing their diffracted shadows on the retina, admits of mathematical demonstration.

“ But without entering minutely into the matter, the proposition may be easily demonstrated thus:—Hold between a convex lens and the white surface on which the image of the light falls, some small object, as a pin. When this is near the lens, its shadow is not seen on the white ground, but when it is brought nearer and nearer the white surface, its shadow appears more and more distinctly.

“ The particles, moreover, appear to be of normal occurrence in the eye, for the appearance of floating muscæ may in general be seen by any person by simply looking through a small aperture in a card at the clear sky, or through the eyeglass of a compound microscope at the flame of a candle two or three feet distant, or simply by bringing the eyelids towards each other, and looking at a lighted candle.”

The treatment of inflammation of the retina must obviously be conducted on the same principle as that of the other inflammations of the eye. Depletion, by abstraction of blood either generally or locally, must be resorted to in

robust persons, or where there exists any of that apparently turgid state of the bloodvessels of the head which is familiarly called fulness or determination of blood, or in language considered to be more exact and scientific, is denominated congestion. This may be particularly necessary in plethoric persons of gouty or rheumatic constitution, or in females of florid complexion suffering from interrupted menstruation; but in persons not so affected the practice should be cautiously adopted. I have, in treating of other inflammations of the eye, suggested the necessity of carefully considering the probable consequences of abstraction of blood from the system of persons of feeble frame and languid circulation, and I have here to repeat the suggestion. It cannot be denied that inflammation, and that perhaps of the most unmanageable description, takes place where the quantity of blood is not greater than usual, or even as great, and where the heart's action, or the capillary circulation, is not carried on energetically. Under such circumstances the removal of any considerable quantity of blood may not only be unnecessary but injurious, and so it will be found in many cases of inflammation of the retina which sometimes occurs in persons of debilitated constitution. In this country, where the labouring classes of the population are so generally badly clothed, fed, and lodged, this means of arresting the progress of this, or any other inflammation, cannot be relied on with so much confidence as in countries where greater comforts are enjoyed; and hence, perhaps, the apparently indiscriminate resort to bloodletting by practitioners in England. In alluding to the occurrence of inflammatory action in feeble constitutions, it may be even right to remind the practitioner that this very state of the frame seems to predispose to local inflammation. Some of the worst cases of amaurosis, evidently the result of *retinitis* of chronic or languid character, occur in persons of feeble frame, debili-

tated by defective nutrition or undue glandular secretion. The amaurosis caused by nursing, or by inordinate exercise of the genital organs, either natural or artificial, is not always merely functional. It is often apparently the consequence of a low inflammatory action which seems to be induced by these debilitating causes, and however contradictory it may appear, or difficult of explanation, observation justifies the conclusion that such is the fact. In considering the expediency of bloodletting in this disease, the occurrence of amaurosis from vascular turgescence within the head, must not, however, be forgotten, and the difficulty of distinguishing it from inflammatory action in the retina must also be kept in mind. In doubtful cases, bleeding being applicable to both conditions, may therefore be resorted to without danger, and with a double prospect of advantage.

The other remedies applicable to other inflammatory disease of the eye are equally applicable in this. Antimonial medicines may be of advantage, but not given to the extent of producing nausea; and purgatives may, perhaps, be used more freely than in other forms of inflammation of this organ, especially in those cases in which doubts may exist as to the defective vision being caused by cerebral disease, or derangement of some important vital function. The principal reliance must, however, as in the other inflammations, be upon mercury, and it must be administered as freely and as effectually as it is in all such cases. I have already, in the extract I have made from the article contributed by me on amaurosis to the *Cyclopædia of Practical Medicine*, alluded to this and other methods of treatment, and quoted Mr. Lawrence's opinions on the subject, and need not therefore again enlarge on the subject. It is sufficient to say that the same resources should be made available as in other inflammatory affections of the eye, and with the same reservations and precautions. Retinitis, or amaurosis from inflammation of the retina, may be mo-

dified by constitutional disease, as iritis or other inflammations, and must be treated accordingly. In persons debilitated by exhausting discharges or secretions, sufficiently nutritious food, and even tonic medicines, must be permitted; at least in the after stages of the disease, and where the rheumatic or gouty diathesis exists, the usual correctives must be employed. Scrofula, if present, must be provided against, and even syphilitic disease considered. Hence, bark, colchicum, and iodine, are brought into operation, and every resource made available to meet each particular condition. In defective vision or blindness from inflammation of the retina, electricity is often employed, but with little reason, and as little success. The loss of sensibility of the nerve depends on disorganization, and can therefore scarcely be restored by any stimulation or excitement, while the inflammatory action lately subdued or subsided, may be revived by such irritation. I think I have seen more cases than one or two where some useful vision remaining after such attacks had been lost by resorting to this remedy. Blistering promises to be beneficial in such cases, and I think proves so in practice, but to be effectual must be continued or repeated for a considerable length of time. It is, I believe, a common practice to dress the blister with strychnine, from a notion that, as this powerful agent, exercising influence on the nerves of motion, and being therefore sometimes found useful in certain forms of paralysis, must also exercise influence on the nerve of sight. It is not, however, found of any use, and is probably persevered in from the necessity of doing something in cases in which nothing can avail. I often try it in the shape of an embrocation or rubefacient, adding some tincture of *nux vomica* to a stimulating liniment, to be applied to the temples. These, however, are remedies more for the consequences of inflammation of the retina than for the inflammation itself.

ON CHOROIDITIS OR INFLAMMATION OF THE CHOROID
MEMBRANE OF THE EYE.

IN treating of the inflammations of the eye affecting particular structures only, and not extending to others, or involving the entire eyeball, it becomes necessary to consider whether the choroid is liable to be so attacked. I have endeavoured to lead the practitioner to the belief that in the more frequent or usual inflammation of the eye, commonly called *iritis*, the whole organ is, if not from the commencement, at least in the progress and sequel, engaged; but I have also endeavoured to explain how far some of the component parts may be the seat of inflammatory action without corresponding disease of the rest. That the choroid in all general inflammations of the eyeball participates in the altered vascular action cannot be doubted; but whether it is ever inflamed alone, and without extension of the disease to the parts in contact and continuation with it, is not so certain. That there is a modification of inflammatory action, called choroiditis, presenting such peculiar characters as to entitle it to be considered of distinct specific nature I admit, but I doubt the correctness of the inference that its seat is the choroid exclusively. It may be said that this is a difference about words, a dispute as to a name; but when it is recollected that the name given to a disease necessarily indicates its character, and thereby influences its treatment, the question assumes importance. However this may be, "*choroiditis*" is one of the forms of inflammation of the eye now very generally admitted by writers, teachers, and practitioners. Dr. Maekenzie of Glasgow, especially, has insisted upon its claims to distinct specific character, and has

given so correct a description of the origin, progress, and termination of the disease, that I cannot do better than introduce it here. He calls it, however, *sclerotico-choroiditis*, which proves that he does not consider the disease to be confined to the choroid exclusively :—

“As the choroid coat is completely hid from view, and exercises but a subsidiary function, it is not to be wondered at, that while inflammation of every other part of the eye has been accurately discriminated, that of the choroid has hitherto scarcely attracted attention. In an early stage, choroiditis is one of the least striking of the ophthalmiæ ; when far advanced, the signs of disorganization which attend it are more remarkable than those of vascular action ; and while the effects are too serious not to have attracted attention, and even received particular names, the cause of these effects, and the seat of the original disease, have in general escaped observation.

“I have already had occasion to mention that iritis is occasionally attended by inflammation of the choroid. Were we to adopt the common notion, that the iris is a continuation of that membrane, we might be led to conclude, that choroiditis and iritis should always go together. Perhaps, in some degree, this may still be the case. At the same time, from the principal arteries which nourish these two parts being quite distinct in their course and distribution, the idea of a separate iritis, and a separate choroiditis, is *à priori* rendered probable.

“For some time, the separate existence of choroiditis was with me rather a matter of speculation, and a conclusion from analogy, than a fact ascertained by observation. I am now convinced, however, that the choroid is sometimes the seat, almost quite independently, of inflammation ; that in certain cases of ophthalmia, it is the focus of the disease, and that the neighbouring parts may be as little affected when

that is the case, as the sclerotica is in iritis, or the iris in sclerotitis. That it is of importance to distinguish the disease which I am now about to describe, will appear evident when we consider its dangerous nature. Its symptoms, as we shall immediately see, are very different from those of any other ophthalmia; and although ultimately the whole eye may be involved by inflammation commencing in the choroid, yet choroiditis, in the early stage exists without any signs of disease in the iris, and without any other effects upon the sclerotica and retina than those which must necessarily arise from the pressure of an inflamed and swollen membrane, placed in contiguity with other membranes more or less susceptible of suffering from that pressure. I consider choroiditis, therefore, as completely a primary and distinct disease. At the same time it must not be overlooked that choroiditis is apt to be superadded to other ophthalmiæ, and especially to serofulous corneitis and iritis, and to arthritic iritis.

“The subjects of choroiditis are generally adults, and more frequently females than males. Those of serofulous constitution are more subject to it than others. I have very rarely seen it in children.

“*Symptoms: Redness.*—One or more of the rectomuscular arteries are enlarged, and running towards the edge of the cornea, are seen to end there in a broad lash of small vessels. There is scarcely ever any general redness over the eyeball, or much inflammation of the conjunctiva. The portion of the sclerotica subjacent to the enlarged vessels frequently presents, in the early stage of the disease, a thickened and fleshy appearance. The conjunctiva also appears thickened. It is probable that, even in this early stage, a preternatural adhesion takes place between the sclerotica and the choroid.

“*Discoloration of the White of the Eye.*—If the disease is checked before any other symptoms manifest themselves

than those already mentioned, the portion of sclerotica which was inflamed, frequently continues to appear thickened, but gradually assumes an opaque white colour; but if the disease proceeds, the exterior tunics of the eye, by and by, become attenuated, so that the choroid shows its dark colour through the sclerotica, which therefore appears blue or purplish. This is one of the most remarkable symptoms, and takes place in many cases at a very early period of the disease, the blueness shining obscurely through the inflamed sclerotica and conjunctiva. We often observe one part of the sclerotica thickened and loaded with enlarged vessels, and another part thinned so as to allow the choroid to shine through. The degree of discoloration is different, according to the severity and duration of the attack, being at the early stage merely perceptible on comparing the diseased with the healthy eye, or the diseased side of the eye with the healthy side, while in advanced cases it amounts to a deep blue. About the eighth of an inch behind the edge of the cornea is the most frequent situation of the discoloration, which generally occupies only one side of the eye, but sometimes surrounds the cornea completely. It is at first narrow in extent, but afterwards becomes broader.

“*Sclerotico-choroid Staphyloma*.—After continuing for a time discoloured merely, the part affected protrudes. The sclerotica and choroid having become preternaturally adherent, and being softened in their texture from the inflammation they have undergone, lose their supporting power. Atrophied and thinned, they cannot sustain the contents of the eyeball, but give way and become protruded. As the previous redness and consequent thinning of the sclerotica commonly occupy only one side of the eyeball, so does the protrusion in question. The protrusion is generally near the cornea, as if the corpus ciliare was the seat of the disease, and more frequently above, or

to the temporal side of the cornea, than below, or to its nasal side. In some cases, there is only one protrusion, which may enlarge to the size and prominence of a filbert ; in others, a number of tumours, of various sizes, surround the cornea ; while, in a third set, the whole eye is enlarged, and the sclerotica attenuated in its entire circumference. Such tumours, or protrusions of the choroid, have received the names of *circsophthalmia*, *varicositas oculi*, *hernia choroidea*, *staphyloma corporis ciliaris*, and *staphyloma sclerotica*. They generally present numerous varicose vessels ramifying over them.

“The front of the eye, however, is not the only seat of staphyloma of the sclerotica and choroid. Scarpa tells us that he had never met with any tumour or elevation of the sclerotica on its anterior surface, resembling a staphyloma ; but that he had twice happened to meet in the dead body with staphyloma of the posterior hemisphere of the sclerotica.

“*Displacement of the Pupil.*—Although the iris is seldom affected with inflammation in choroiditis, the pupil, in many of the cases which I have witnessed, underwent a remarkable change of place. The iris is always narrowed towards the portion of the choroid which is affected, and in many instances, the pupil is observed to have moved so much out of its natural situation, as to be almost directly behind the edge of the cornea. Upwards, and upwards and outwards, are the directions in which the pupil is most frequently observed to become displaced. It occasionally continues small and moveable, in other cases it is immoveable, but not dilated ; in very severe cases it is greatly enlarged, the iris having entirely disappeared at that part of its circumference towards which the displacement of the pupil has happened. The pupil does not return to its place, even although the other symptoms of choroiditis are subdued. We sometimes observe the iris,

in cases of choroiditis, to be of a slate colour, and the pupil to be more or less filled with lymph. These changes denote the previous existence of iritis.

“ *Opacity of the Cornea* is not a necessary, although a frequent attendant on choroiditis. It is generally the edge of the cornea nearest to the portion of affected choroid which becomes opaque, so as to resemble part of a broad arcus senilis, or as if the sclerotica were intruding on the cornea, the rest of the cornea remaining perfectly clear. In other cases, there are pretty extensive, but very irregular spots of whiteness, more the effect apparently of interrupted nutrition than of inflammation. In some cases I have observed the cornea smaller than natural, but more frequently it not only becomes almost quite opaque, but partaking in the staphylomatous degeneration of the neighbouring sclerotica, it even undergoes a degree of dilatation, so as to become considerably broader and more prominent than in its natural state, and scarcely distinguishable from the attenuated sclerotica. I have sometimes thought that in such cases, a watery effusion might have separated the ciliary ligament, so as to lodge between the cornea and sclerotica externally and the iris and choroid internally. From the affection of the cornea alone, in such cases, independently of the interior changes of the eye, the patient's vision may be almost or altogether lost.

“ In consequence of choroiditis, the eye may enlarge so much as to protrude from the orbit to a very considerable degree, without much inflammation of the sclerotica and conjunctiva, these tunics being merely thinned by the pressure of the distended choroid. After a time, however, the eye, in this state of exophthalmos, is apt to suffer from external inflammation, in consequence of being but imperfectly protected by the lids, or it may be in consequence of cold or mechanical injury. When the inflammation, thus excited, runs to a great height, the conjunctiva be-

comes chemosed, puriform fluid is deposited behind the cornea, or between its lamellæ, the eye bursts, continues to swell and protrude still more, assumes a fungous appearance, bleeds profusely, and being productive of great pain and deformity, evidently requires to be extirpated.

“ *Intolerance of Light* and *Epiphora* generally attend this disease in a considerable degree.

“ *Pain*.—This varies much in different individuals. When there is as yet no protrusion, the pain is moderate; when the sclerotica is much pressed and distended, and especially when this takes place suddenly, and is attended with considerable increase of redness, the pain in the eye becomes severe, and sometimes furious. Hemicrania is also present, affecting principally the top of the head, the high part of the temple, and the cheek. It is not strictly circumorbital, nor is it strikingly nocturnal.

“ *Vision* is variously affected in choroiditis. In some instances, the very first symptom complained of is dimness of sight. The patient generally complains of photopsia, and not unfrequently of iridescent vision. Hemioptia, all objects to one or other side of a perpendicular line, or above or below a horizontal line, appearing dim, all objects appearing confusedly, and as if double, even when viewed with one eye, are symptoms which not unfrequently distress the patient long before the redness or blueness of the eye attracts attention. If the disease goes on, we sometimes find that total blindness ensues, even when the choroid appears but partially affected; while in other cases the whole eyeball is evidently enlarged and discoloured, and yet a considerable degree of vision is retained.

“ Recovery is always slow. If the disease has gone to any considerable length, it is scarcely ever completely removed. The vestiges of it are in general permanent, even after it has been completely checked in its progress. In many cases, we may reckon ourselves fortunate if we arrest the

disease. Yet it sometimes happens that the cure proceeds to a degree beyond our expectation. I attended a gentleman who many years before had lost all useful vision in the left eye from this disease. The right was now attacked. Both pupils were greatly displaced; the visible arteries of the right eye were much dilated, and the sclerotica at different places considerably attenuated; the left eye was enlarged, of a pretty deep blue colour, and a great part of the cornea opaque. By bloodletting, counter-irritation, and other remedies, the disease was arrested in the right eye, and very unexpectedly the left eye recovered to such a degree, that he was again able to read with it an ordinary type."

The "redness" which Dr. Maekenzie describes above as the first and most prominent symptom is one of the most characteristic features of the disease. He says, "one or more of the recto-muscular arteries are enlarged, and running towards the edge of the cornea, are seen to end there in a lash of small vessels," but I think the practitioner cannot rely on this as a constant appearance to guide him in his diagnosis. The redness probably always commences in the direction of these arteries, but it does not always appear confined to their course. The sclerotic vascularity in this disease, in fact, differs from the usual sclerotic vascularity of iritis or general inflammation of the eyeball. Instead of being produced by numerous vessels regularly and uniformly converging towards the margin of the cornea, and there forming a pink zone, it is the effect of more insulated and circumscribed vascular enlargement. It appears at first, to use more common language, as a small pink patch in the white of the eye, near the cornea, about quarter of an inch in diameter, while the remainder of the sclerotic retains its natural whiteness, or is marked by one or more patches of a similar nature. The red patches soon become elevated,

and assume a thickened or fleshy appearance, the conjunctiva often participating little in the inflammatory action. It should not, however, be forgotten that a vascular patch answering to this description often remains after the disappearance of a pustule or pimple in common pustular ophthalmia, and may be mistaken for the change which I am describing ; but as it belongs to the conjunctiva, it may be moved over the sclerotic by drawing that membrane on one side, and thus be distinguished. As the disease advances, these vascular patches become diffused and mixed with each other, until at length the whole white of the eye, or exposed part of the sclerotic, becomes red, although not presenting the usual vascular arrangement observed in common iritis. Distinct vessels are not visible converging to the cornea, but a general redness or stain, more intense in some places than in others, and more of a light purple tint than the florid or scarlet vascularity of more general inflammation.

As the disease advances, the change in structure is more conspicuous. The sclerotic loses its natural semi-opaque fibrous condition, and becomes thin and transparent, allowing the dark colour of the subjacent choroid to become visible in dark spots or patches, which ultimately become elevated into blue or black prominences or projecting tumours ; a kind of hernia or protrusion of the latter membrane from want of the support of the sclerotic thus disorganized. In treating of inflammation of the eye in general, I alluded to this effect upon the sclerotic, and stated that it was not confined to the peculiar form or variety called choroiditis, but that it often took place in the other species of inflammation. It may, however, I think be admitted that it occurs more frequently in the disease now under consideration, although it may take place in any form. In fact, I consider it one of the inevitable consequences of inflammation implicating the sclerotic and

choroid of whatever character, when that inflammation is protracted or chronic, or when it is renewed in frequent relapses. I believe also that it is more liable to occur in persons of scrofulous habit or feeble frame, and hence its greater frequency in this so-called choroiditis which is seen generally in persons of such constitution. In treating of inflammation of the cornea, I also alluded to this effect of inflammation upon the firm or supporting structures of the eye, and insisted upon the fact that this is one of the inevitable consequences of continued inflammatory action upon such parts, and that it is not to be attributed to any physical force or pressure, but to the destruction of the original organization or peculiar vital condition of these membranes. It is not in inflammations of the eye alone that this alteration in the nature of parts takes place, it is the fertile source of permanent defect and deformity in other parts of the body. When describing the progress and consequences of scrofulous inflammation of the eye, I directed attention to the changes in organization and form produced by it, and mentioned that they are sometimes so great and peculiar that they are liable to be mistaken for malignant disease. In the inflammation now under consideration, the same mistake may be made by those who have not frequently seen its effects. The general enlargement of the whole eyeball, deformed by irregular black prominences of various shapes and dimensions, projecting from a leaden-coloured sclerotic crowded with tortuous blue veins, affords an appearance which even experienced surgeons might suspect to be fungus hæmatodes, were it not that the history of the case, and the fluid nature of the contents, convinces them to the contrary.

As this disease proceeds, other structures of the eye, besides the sclerotic and choroid, become engaged. The cornea, at that part in its margin which touches the original red patch or subsequent dark tumour, becomes opaque,

and in some time thin, and permeated by red vessels, so as to form part of the blue prominence ; and when several of these take place, they coalesce all round the margin so completely, that it forms the centre of one general tumefaction, losing its original correct curvature, and becoming enlarged in its circumference. This extension of the disease to the cornea, when not accompanied by any considerable formation of separate blue tumours in the sclerotic, but by a general attenuation of that membrane, and uniform enlargement of the eyeball, constitutes the disease called *hydrophthalmia*. It is remarkable that this extension of the inflammation to the cornea does not induce the general disease of that structure, which has been described under the head of *corneitis* : the centre of it often remains transparent while all this mischief is in progress.

The iris also partakes of the disease. It does not at the commencement exhibit the appearances observed in any of the forms of *iritis* ; but as the sclerotic yields, and the cornea becomes flattened and enlarged in its circumference, the pupil becomes eccentric or drawn to one side, irregular in form, and incapable of contracting ; the colour, also, is changed, and the natural perfect organization disappears. Adhesions are sometimes formed between the margin of the pupil and the capsule of the crystalline lens, accompanied by loss of transparency, and consequent general haziness of the transparent parts.

This extension of the inflammation in this disease from the sclerotic and choroid to the cornea and iris strengthens the conclusion that it is not a mere *choroiditis*, while the escape of the retina, lens, and vitreous humour, from participation in the malady, proves that it is more or less circumscribed or insulated. It cannot, perhaps, be said that opacity of the lens and insensibility of the retina (*cataract* and *amaurosis*) never take place in these attacks ; in some, where the primary inflammation is severe and rapid in its

progress, they undoubtedly do ; but it may with safety be asserted that in many cases the crystalline lens and retina are unaffected. I have often been astonished on observing the comparative perfection of vision enjoyed by patients having the whole eyeball enlarged, and the sclerotic and cornea forming one irregular covering of semitransparent membrane, spotted with dark patches and blue tortuous veins. This disease, whatever may be the name given to it, appears in fact like corneitis and inflammation of the membrane of the aqueous humour, to be confined to the anterior part of the organ, and not to extend to the deeper seated parts, except in very violent and destructive attacks.

Loss or great imperfection of vision is, from the facts above stated, not to be enumerated as a prominent symptom in this disease. In the first stage, when there are no visible proofs of the existence of inflammation except the red patches described, the sight is not much impaired. There may be complaints of a haze or cloud, but none of that alarming loss of sight which accompanies common iritis ; and as the disease advances to its most destructive degree, there is no corresponding amount of blindness. Pain and intolerance of light are also frequently so inconsiderable that they do not attract attention as remarkable symptoms, although in some cases they are distressing, and require special care.

Of the nature or causes of this variety of inflammation of the eye, it is not easy to pronounce a decided opinion. It evidently differs in its original condition, progress, and effects from the more frequent and ordinary species. This, as I have already intimated, I am however more inclined to attribute to peculiarity of constitution than to peculiarity of the structure supposed to be the seat of the disease. In other words, I do not consider it to be a mere choroiditis, but a destructive disorganizing inflammation confined to the more anterior part of the eye, and including

the sclerotic, cornea, membrane of the aqueous humour, and iris. In its nature it is less active, and in its progress less rapid than common inflammation. The redness is not so great, or of the same tint or vascularity, and pain does not so generally accompany it. Hence it is more insidious in its approaches, and by its slow progress more likely to throw the practitioner off his guard. There are exceptions, but this is, I think, the general character of the disease. It is also to be kept in mind that it occurs more frequently, if not exclusively, in persons not enjoying robust or vigorous health, but suffering from languid circulation and defective nutrition, or even scrofulous diathesis. It also is observed at a particular period of life, from about fifteen to five-and-twenty; and in females much more frequently than in males. I do not think I have seen it in children, and do not consider the alteration in shape of the eye, or the dark staphyloma of the sclerotic produced by inflammation in persons advanced in life, to be the same disease. It is also a character of this disease to return or relapse, the final destruction of the organ being generally effected in this way rather than by first and single attacks. It is obvious from the description above given of this form of inflammation of the eye, that it does not require the same amount of active treatment necessary in the more acute varieties. The two great resources relied on in violent and rapid attacks, depletion and mercury, are frequently not only unnecessary, but even pernicious. It is often, in fact, more an example of the slow destructive process accompanied by increased local vascular action which is scarcely to be considered inflammation, than true inflammation itself. The time is not, perhaps, far distant when these circumscribed local disorganizations, or even more extended derangement of vascular arrangements, will not be considered of the same nature as the condition which exists in unequivocal inflammatory action. The adoption

of such terms as congestion, subacute inflammation, and similar phrases, implying the existence of various degrees of this state of parts, strengthen this conclusion. I do not mean to deny that the disease now under consideration ever assumes the form of active inflammation; it sometimes undoubtedly does, especially in relapse attacks; all I mean to insist upon is, that its general nature is of a languid or feeble character; and I am inclined to think that when great vascular action, pain, intolerance of light, and blindness exist or supervene, the term choroiditis should not be used but reserved for the form of a disease better entitled to that specific distinction.

I have, in treating of the other forms of inflammation, so fully discussed the question as to depletion by abstraction of blood, that it is unnecessary to return to it at length. I have not, I think, met with any case of this disease either requiring general bleeding from the arm or temporal artery, or admitting of it. Symptoms are, however, often sufficiently acute at the commencement of a first attack or of a relapse to demand the application of leeches; not so much, perhaps, with the view of reducing the quantity of circulating blood as to diminish local turgescence by a diversion of its current; or rather, indeed, to effect that reduction of vascular action which experience has taught us this method of drawing blood causes. This view is, however, so much at variance with that of Dr. Mackenzie, that I think it right to copy his opinion here:—

“Profuse and repeated bloodletting does more good in the early stage of choroiditis than all other remedies put together. Yet we might perhaps not be tempted to bleed sufficiently at this period of the disease, from the circumstance that in many instances, there are no external signs of intense inflammation, and the patient does not suffer any acute pain. The practitioner, therefore, who is not

acquainted with the nature and symptoms of this ophthalmia, might be apt to trifle away time in the application of a few leeches, when he should be opening the temporal artery, and removing a large quantity of blood. I have known the blueness and evident distension of the sclerotica, which, notwithstanding leeching and other remedies, had continued unabated for many weeks, disappear suddenly and completely, after the loss of twenty or thirty ounces of blood from the temple. Bleeding from the jugular vein, or from the arm, is also highly useful. Twenty-four or more leeches round the eye, every second day, I have seen attended by the best effects. In chronic cases, we must not neglect the frequent and liberal application of leeches. In the repeated and often severe attacks of pain which occur in the course of sclerotico-choroiditis, if the pulse is not affected, blood taken from the arm is not buffy, and venesection does little good."

From this I am almost inclined to think that I have not been describing the disease to which Dr. Maekenzie has been directing his attention. What I call *choroiditis* I have so generally seen, occurring, as I have stated, in persons of feeble constitution, and so often in females of delicate frame and impaired health, that I find the treatment here recommended inadmissible. I do not consider violent inflammation of the eyeball to be entitled to a distinct specific character, and to be called choroiditis, because the sclerotic becomes blue and distended in consequence of it, I am more inclined to restrict the term, as I have said, to the languid inflammation above described. The late Mr. Tyrrel, in treating of *choroiditis* in his work on Diseases of the Eye, expresses opinions more in unison with those which I venture to offer, and I therefore quote them; although I have some doubts as to the application of his observations to the disease alluded to by me or Dr. Mac-

kenzie. I quote them also because I find that Mr. Tyrrel, more than any British surgeon, insisted upon the necessity of carefully distinguishing the more feeble or languid forms of inflammation from the more active, and adapting the treatment accordingly:—

“The medicinal and dietetic treatment must depend upon the condition of the constitutional power of the party affected; most frequently, as I have stated, the disease occurs in persons having a serofulous diathesis, and therefore generally weak power. Of the number of cases of this disease which have come under my observation, I am certain that, in nineteen out of twenty, it has occurred when the general power has been below par. Supposing, therefore, that such be the condition of the patient, the diet should be good and nutritious; he should take small doses of mercury with chalk, or very minute doses of the bichloride of mercury, or in some instances, Plummer’s pill; but in addition to either form of mercury, some tonic should be given; the form of which must depend upon the peculiarity of the constitutional disturbance, or the influence of any particular functional derangement. Thus, in some instances, sarsaparilla or bark may be proper; in other cases, the addition of mineral acid may be serviceable, as when the cutaneous action is inordinate; or further, some preparation of steel may be employed with advantage, as in the case of the young female suffering from irregularity of uterine function, &c. &c.

“Sometimes cases occur in which the disturbance of general health has been principally produced and maintained by causes which tend to exhaust too rapidly the general power; such as excess of application to a sedentary employment, with deficient rest, or prolonged lactation in the delicate female, or excess in venereal gratification, or onanism.

“An unusual degree of debility, without derangement of any important function, generally characterises such cases. The importance of distinguishing them must be obvious ; as without a removal of the exhausting cause, there can be little chance of reinstating the general power.

“The principle of treatment consists in promoting and maintaining a proper degree of constitutional power, by withdrawing the causes of exhaustion, by correcting error in important functions, by the use of a generous diet, and by the administration of tonic remedies ; and at the same time in checking the local morbid action, by the alterative influence of mercury or iodine, and the aid of counter-irritation. Sometimes the disease occurs when the condition of the vascular system is too full, and under such circumstances, symptoms are usually more decided in their origin, more rapid in their progress, and attended with more local distress. The aspect of the patient and the state of the pulse can hardly fail to indicate to the medical man this state of plethora ; and his endeavour should then be, to reduce the fulness of the vascular system, by a moderate abstraction of blood, by a spare diet, by a free action upon the mucous and cutaneous surfaces, and by quietude ; and as soon as he has brought the action of the heart and arteries to the proper level, he should commence the alterative or mercurial treatment, and be careful not to continue the depletory treatment, so as to reduce the general power below its ordinary standard ; otherwise the alterative or mercurial will fail to produce the desired effect.

“Should the disease assume an acute character, as indicated by the symptoms which I have before described, abstraction of blood generally may be required : but it should always be taken away in moderation, only in sufficient quantity to diminish tension of the arterial system, should it exist ; or locally, to relieve congestion of the affected organ, without influencing the general circulation.

“ When decided inflammatory action, therefore, occurs, the treatment must be active, in proportion to the urgency of the local symptoms, and to the power of the patient. I have observed that the disease principally attacks those of naturally feeble constitution. If, then, depletion be requisite, the patient should be most carefully watched during its continuance; so that it may not be carried beyond the extent required to check acute symptoms, nor produce unnecessary exhaustion. In many cases, when the disease is apparently acute, but the power feeble, the loss of blood aggravates rather than benefits the affection. I have known the continuance of depletory treatment prove most injurious in augmenting morbid action and hastening the disorganizing process, especially in young and delicate persons.

“ Unfortunately, as relief from pain frequently follows the local abstraction of blood, the patient is desirous of resorting to such treatment again, upon every fresh attack or relapse; and the medical attendant, often unacquainted with its injurious effects, readily adopts it. The relief is, however, of short duration; another burst of acute symptoms soon occurs: the same remedies are again resorted to, with similar effect, by which the patient is further reduced in power, and the local disease makes further progress in disorganization. Under continuance of the treatment, the patient suffers from repeated attacks of an acute kind, each of which produces an increase in the amaurosis, and eventually vision is completely destroyed; and at the same time the general health is materially deranged, if not permanently injured.

“ I have seen several very distressing cases of permanent amaurosis resulting from such treatment; and I have also known many instances in which the disease has been arrested and vision preserved, by raising and maintaining the general power, and pursuing the treatment which I

have recommended, after many weeks of depletion had failed to check the morbid action."

From what I have stated above, as well as from the opinions quoted, it is obvious that the practitioner will be called on to exercise his judgment in the treatment of this disease, as regards bleeding, with much consideration; not resorting to it indiscriminately, because the parts are red and painful, if the state of the constitution forbids it, or again refraining from it, if symptoms and vigorous health justify its adoption.

After the preceding observations respecting the necessity or expediency of the abstraction of blood in this inflammation, the diminution in quantity or alteration in quality of the circulating fluid by other means requires less to be considered in detail; and the reduction of the action of the heart or capillaries to be less discussed. The administration of antimonial medicines to cause nausea or debility, or any state approaching to it, is uncalled for, except in those very severe forms which I have said I do not consider entitled to the title of choroiditis, but they may be given with advantage in combination with mercurial medicines in moderate quantity, until the cutaneous secretion affords evidence of their influence in the system. Purgatives also as a means of depletion may be dispensed with, although required as a preliminary measure to remove intestinal irritation and to arrest active nutrition. Considering the disease to be accompanied by a feeble or languid state of the circulation, and an inactive operation of the nutritive function, or even to be a consequence of this, denial of nutritious food cannot be sanctioned: what is called low diet or slops must not be thought of; although such reduction in quantity and quality of food as may be necessary to keep local inflammation within bounds may be permitted. I have, in treating of the other forms of

inflammation, objected to the common practice of cutting off all supply of new blood, and leaving the system to be sustained by its old and exhausted fluids in these or any other inflammations, and I here again object to it. The supply of nutritious food may be suddenly and temporarily interrupted on the same principle as that recognized when blood is drawn, but its continued denial is wrong, and more especially in the form of inflammation now under consideration. Low diet and slops are mischievous in another way. Their sudden substitution for the nutritious and digestible food previously in use, not merely interrupts but disturbs the functions of the stomach and alimentary canal, causing corresponding disturbance of the entire system, and consequently what may be called an unhealthy modification of the local inflammation. The practitioner called on to treat inflammations occurring in feeble and unsound constitutions must keep this in view whatever his opinions may be as to the necessity of active depletion.

In this circumscribed inflammation of the anterior part of the eye, ending in attenuation of the sclerotic and projection of the dark choroid, and occurring in persons of feeble frame or unhealthy constitution, mercury does not appear to exercise the same salutary influence that it does in other forms of inflammatory disease of this organ. The full administration of it to the extent of producing salivation is not only useless, but pernicious, by disturbing general health and interrupting nutrition. Smaller doses, however, given in combination with other remedies, appear to exercise a salutary influence; as with moderate doses of antimonial medicine at first, and with tonics subsequently. Three grains of the *pilula hydrargyri*, with about a tenth of a grain of tartrate of antimony, may be given three times a day for a couple of days, and then the same continued every night, with tonics or iodine in the course of the day. In fact, mercury as an alterative, and

iodide of potassium, and bark or quinine, in such doses as may be necessary to correct the feeble or languid state of the constitution which accompanies the local disease. As the disease more frequently takes place in females, attention must be paid to the uterine functions, and it may be necessary to combine emmenagogues and preparations of iron with the other remedies, or to administer them in the course of the treatment. Iodide of iron appears to be an eligible preparation, giving about a grain three times a day in syrup, made according to recent pharmaceutical formulæ. Dr. Mackenzie recommends the arseniate of potass, the thirty-second part of a grain, three times a day. These remedies are, however, to be reserved for the chronic stage of the disease, or when it lingers or relapses.

When the black prominent tumours protrude, so as to cause great deformity, or to create pain by their bulk in friction against the eyelids, they may be punctured with a cataract needle, but not until inflammation has disappeared. The practitioner should not, however, place too much reliance on the practice. I have sometimes found them little reduced after repeated tapping, and have seen the operation followed by violent inflammation and suppuration of the entire eye. When the whole eyeball becomes enormously enlarged, irregular in form, and projecting so that the lids cannot meet over it, the question of freely opening or extirpating it arises. From my experience in such cases, I feel inclined to suggest the bolder and more decisive measure of extirpation before the apparently less hazardous and destructive one of making a free opening or removing the anterior portion, as in cases of projecting staphyloma. I do not allude to any proposal to extirpate the organ during the existence or progress of the inflammation; that I consider out of the question, because no one could with certainty calculate on the effect of such violence on inflamed parts; and because the eyeball often shrinks

or contracts as the inflammatory action subsides. I confine my present observations to the case in which the eye is seen perhaps a year or more after the first attack, and after all traces of inflammation have disappeared. Then, whether we call it a great protruding staphyloma, a hydrophthalmia, or an enlarged eyeball from choroiditis, I believe the patient will suffer less from total extirpation than from free opening with or without removal of a portion of the parts. If the greater portion of the diseased organ be allowed to remain, inflammation and suppuration is inevitable, and, from the nature of the structures engaged, must be distressing and tedious. Indeed, the inflammation following such operations is sometimes most violent and alarming, extending as it does to the cellular membrane of the whole orbit, and causing enormous tumefaction, tension, and pain. If, however, the whole eyeball is removed, the wound of the remaining contents of the orbit either unites, or it heals by granulation and cicatrization, kindly and without accident. In one case a young woman, who was greatly disfigured and much annoyed by an enormously distended eyeball, in which I removed the whole organ, there was not a bad symptom, and she was walking about the ward at the end of the week. The operation is not attended with any difficulty. An opening is first to be made, and the contents allowed to escape, after which the flaccid sclerotic should be drawn forward with a hook, and clipped from its connexions with curved scissors. I have not, however, seen enough of the practice to justify me in submitting it as a rule, but rather as a suggestion.

ON INFLAMMATION OF THE CRYSTALLINE LENS.

TO COMPLETE the description of the inflammations of the component structures of the eyeball, it is necessary to inquire whether or not the crystalline lens is ever the seat of that destructive action, either alone or in common with the other parts of the organ. To some it may appear to be but unnecessary refinement to endeavour to establish the existence of another specific form of disease on the assumption that a distinct and peculiar piece of organization must necessarily present under inflammatory action distinct and peculiar appearances and symptoms; but after due consideration the discussion of the question will not be found without its advantage. The crystalline lens is, it is true, but small in size, and from its transparency and apparent independence of vascular nutrition appears little liable to inflammation, but its integrity is so essential to perfect vision that every cause tending to impair its functions merits careful study. In order to enable the reader to take a clear view of the subject, it is, however, necessary to refresh his memory as to the anatomical condition and physiological relations of the part, and for this purpose I introduce here some observations which I have elsewhere made relative to the organization of the part in question. In a communication made by me to the Medico-Chirurgical Society of London, and published in the 12th volume of the Transactions of that body in 1823, I endeavoured to explain the true anatomical structure of the crystalline lens and the real nature of its connexion with the other parts of the organ, and through them with the system at large; to show, in fact, its vital condition and its mode of growth and nutrition: and in an article on the Anatomy

of the Eye, published in the Cyclopædia of Anatomy and Physiology, I again directed attention to the subject. From the latter work, I copy the following paragraph:—

“It appears to be generally assumed by writers on anatomy that a watery fluid is interposed between the body of the lens and its capsule, from an incidental observation of Morgagni when discussing the difference in density between the surface and centre of the lens; hence it has been called the *aqua Morgagni*. The observation of this celebrated anatomist, in his *Adversaria Anatomica*, which has led to the universal adoption of this notion, is, however, merely that upon opening the capsule he had frequently found a fluid to escape. “*Deinde eâdem tunicâ in vitulis etiam, bobusque sive recens, sive non ita recens occisis perforata, pluries animadverti, illico humorem quendam aqueum prodire: quod et in homine observare visus sum, atque adeo credidi, hujus humoris secretionem prohibitâ, crystallinum siccum, et opacum fieri ferè ut in extraeto exsiccatoque crystallino contingit.*” He does not, however, subsequently dwell upon, or insist upon the point. I do not believe that any such fluid exists in a natural state, but that its accumulation is a consequence of loss of vitality; the water combined with the solid parts of the lens escaping to the surface and being detained by the capsule, as occurs in the pericardium and other parts of the body. In the eyes of sheep and oxen, when examined a few hours after death, not a trace of any such fluid can be detected, but after about twenty-four hours it is found in considerable quantity. In the human eye a fluid sometimes accumulates in the capsule, constituting a particular form of cataract, which presses against the iris, and almost touches the cornea; but such eyes are, I believe, always unsound. From this erroneous notion of an interposed fluid between the lens and its capsule has arisen the adoption of an unsustained and improbable con-

elusion, that the lens has no vital connexion with its capsule, and consequently must be produced and preserved by some process analogous to secretion. Respecting this matter I have observed, in the paper above alluded to—

‘The lens has been considered by some as having no connexion with its capsule, and consequently that its formation and growth is accomplished without the assistance of vessels ; such a notion is so completely at variance with the known laws of the animal economy, that we are justified in rejecting it, unless supported by unquestionable proof. The only reasons which have been advanced in support of this conclusion are, the failure of attempts to inject its vessels, and the ease with which it may be separated from its capsule when that membrane is opened. These reasons are far from being satisfactory ; it does not necessarily follow that parts do not contain vessels, because we cannot inject them ; we frequently fail when there can be no doubt of their existence, especially where they do not carry red blood. I have not myself succeeded in injecting the vessels of the lens, but I have not repeated the trial so often as to make me despair of accomplishing it, more especially as Albinus, an anatomist whose accuracy is universally acknowledged, asserts, that after a successful injection of the capsule of the lens, he could see a vessel passing into the centre of the lens itself. Lobé, who was his pupil, bears testimony to this. The assertion that the lens is not connected with its capsule, I think I can show to be incorrect ; it has been made from want of care in pursuing the investigation, and from a notion that a fluid exists throughout between the lens and its capsule. When the capsule is opened, its elasticity causes it to separate from the lens ; especially if the eye be examined some days after death, or has been kept in water, as then the lens swells, and often even bursts the capsule and protrudes through the opening, by which the connexion is destroyed. I have,

however, satisfied myself that the lens is connected with its capsule (and that connexion by no means slight) by the following method. I remove the cornea and iris from an eye, within a few hours after death, and place it in water, then with a pair of sharp-pointed scissors I divide the capsule all round at the circumference of the lens, taking care that the division is made behind the anterior convexity, so that the lens cannot be retained by any portion of the capsule supporting it in front. I next invert the eye, holding it by the optic nerve, when I find that the lens cannot be displaced by agitation, if the eye be sufficiently fresh. In the eye of a young man about six hours dead, I found that, on pushing a cataract needle into the lens, after the anterior part of the capsule had been removed, I could raise the eye from the bottom of the vessel, and even half way out of the water, by the connexion between the lens and its capsule. It afterwards required considerable force to separate them, by passing the needle beneath the lens, and raising it from its situation. I believe those who have been in the habit of performing the operation of extraction, have occasionally encountered considerable difficulty in detaching the lens from its situation after the capsule had been freely opened, this difficulty I consider fairly referable to the natural connexion just noticed.' When the lens enclosed in its capsule is detached from the hyaloid membrane, the connexion between it and the capsule is destroyed by the handling, and in consequence it moves freely within that covering, affording to those who believe that there is no union between the two surfaces fallacious evidence in support of that opinion, which, if not sustained by better proof, should be abandoned. Dr. Young insists upon the existence of the natural connexion by vessels and even by nerves between the lens and its capsule: he says—'The capsule adheres to the ciliary substance, and the lens to the capsule, principally in two or three points; but I con-

fess I have not been able to observe that these points are exactly opposite to the trunks of nerves ; so that probably the adhesion is chiefly caused by those vessels which are sometimes seen passing to the capsule in injected eyes. We may, however, discover ramifications from some of these points upon and within the substance of the lens, generally following a direction near to that of the fibres, and sometimes proceeding from a point opposite to one of the radiating lines of the same surface. But the principal vessels of the lens appear to be derived from the central artery, by two or three branches at some little distance from the posterior vortex, which I conceive to be the cause of the frequent adhesion of a portion of a cataract to the capsule about this point ; they follow nearly the course of the radiations and then of the fibres ; but there is often a superficial subdivision of one of the radii at the spot where one of them enters.' The great size of the vessels distributed on the back of the capsule in the fœtus strengthens the conclusion that the lens is furnished with vessels as the rest of the body. When the eye of a fœtus of seven or eight months is finely injected, a branch from the central artery of the retina is filled and may be traced through the centre of the vitreous humour to the back of the capsule, where it ramifies in a remarkably beautiful manner, assuming, according to Sömmerring, a stellated or radiating arrangement. Zinn declares that he found branches from this vessel penetrating the lens:—'*Optime autem placet observatio arteriolæ lentis, in oculo infantis, ejus vasa eera optime erant repleta, summa voluptate mihi visæ, quam prope marginem ad convexitatem posteriorem dilatam, duobus ramulis perforata capsula in ipsam substantiam lentis profunde se immergentem cortissime conspexi.*' He also quotes the authority of Ruysch, Moeller, Albinus, and Winslow, as favouring the same view. Against such authority, I find that of the French system-

atic writer Bichat advanced ; but on such a point his opinion is of little value."

The object of these observations was to combat a prevalent erroneous notion that the crystalline lens has no vital connexion with the rest of the frame, but exists in an insulated state within its capsule. Since they were made, however, this subject has been again investigated in making inquiries as to the vitality, growth, and nutrition of some other parts apparently destitute of vessels. From these inquiries it appears probable that such structures may grow and be nourished by the transmission of nutritious material from bloodvessels distributed upon their surfaces into cells or corpuscles enveloping and pervading them. Mr. Toynbee, in a communication published in the *Philosophical Transactions* in 1841, makes the following observations:—"All these non-vaseular tissues are in structure very analogous: they all contain corpuscles or cells, of which some of them are almost entirely made up. When the almost universal presence of these cells is considered, I think it cannot be doubted but that they perform important parts in the functions of nutrition and secretion. I am induced to agree with M. Schwann that these cells have vital actions, and I believe that they not only possess them in the tissues during development, but also in subsequent periods of life. I ascribe to them the function of circulating and perhaps changing the nature of the nutrient fluid which is brought to the circumference of the solid non-vaseular tissues, and I believe them in some measure to compensate for the absence of the internal vascularity possessed by other structures. In proof that they possess vital properties, I may allude to the changes undergone in the structure of the cornea and the crystalline lens without the penetration of them by any vessels. The only difference which appears to me to exist between the mode of nutrition in the vas-

cular and the non-vascular animal tissues is, that *the former* derive their nutrient fluid from the blood which circulates through the capillaries contained in their substance; and that *the latter* are penetrated by the nutrient fluid which exudes from the large vessels by which they are surrounded, and that its distribution through them is assisted by the vital properties of the corpuseles which they contain; in *both classes*, the particles of which the tissues are composed attract from this fluid the elements which nourish them. According to the researches of M. Schwann, the crystalline lens, in the earliest periods of its development, is entirely composed of cells; and it is the opinion of Valentin and himself, that these cells are converted into the fibres of the lens. The dentations of the fibres of the lens are compared by M. Schwann to the sinuosities of a not uncommon form of vegetable cells. In the examinations that I have made of the crystalline lens, I have not only found cells interspersed among its fibres, but have frequently seen the fibres themselves, composing the external part of the lens, made up of these cells; and in other instances they occupy the margin of the fibres only.

“The crystalline lens, in a healthy state, has never been seen to contain bloodvessels. Müller, in speaking of the mode of development of this organ, says,—‘The matrix of the crystalline lens is its capsule, which seems to secrete the layers of the crystalline from its inner surface.’ The presence of vessels in its substance would certainly interfere with the functions of the crystalline lens; for, as I have said, perfect transparency is essential to its office of transmitting light. In the anterior capsule, according to Müller, ‘the vessels are extremely difficult to inject;’ he, however, states that in ‘inflamed eyes they are distinct, both on the anterior and posterior walls of the capsule.’ The presence of bloodvessels in the anterior capsule of the lens would as effectually derange the functions of the eye,

as if they were in the substance of the cornea, or in the lens itself.

“I have not only been unable to trace vessels into the anterior capsule, but I hope to prove that in the healthy state no vessels do enter it. The posterior capsule of the lens is, however, injected with facility, and contains large and numerous ramifications of bloodvessels; I ascribe to them the function of supplying the crystalline lens with a nutrient fluid. These vessels arise from the *arteria centralis retinæ*; the latter, having traversed the centre of the vitreous humour, expands upon the capsule, and forms the ramifications just noticed. Now in some injections which I have made of the eyes of a human fœtus, of the sixth or seventh month, these vessels were not confined to the posterior surface of the capsule; they pass round its border and extend upon its anterior face to the extent of one quarter of a line. I have not been able to make a perfect injection of the vessels of the capsule of the lens in ages antecedent to the fifth or sixth month of the fœtal life, and therefore am unable to say whether in the very early periods of development, the anterior capsule, like the *membrana pupillaris*, is entirely traversed by vessels; the crystalline lens would, under such circumstances, be completely surrounded by bloodvessels.

“The branches of the *arteria centralis retinæ* in the early periods of life, as noticed above, extend upon the anterior surface of the capsule. Immediately they reach the latter they become straight, run parallel with each other, and are directed towards the centre of the anterior surface for the distance of a quarter of a line, when they stop in their course, and form looped dilatations, which give origin to small veins. It is most probable that these vessels recede at subsequent periods of development, so as to leave the whole of the anterior surface of the capsule capable of being permeated by the rays of light. These

vessels, in a diseased state, are sometimes prolonged into the whole of the anterior capsule, (or to speak with more propriety, the anterior half of the capsule), where, in morbid specimens, they have been injected by Schroeder Van der Kolk. The capsule of the lens is thus pervaded by large and numerous ramifications of bloodvessels, which I believe pour out upon its inner or lenticular surface a nutrient fluid; this *fluid will immediately come in contact with the mass of delicate cells described by Schwann as situated between the lens and the capsule.*

“The mode of nutrition of the crystalline lens may be explained, by supposing that the nutrient fluid is received by the cells just alluded to, and conducted to the lens (perhaps has its characters changed in its course by the metabolic functions ascribed to them by M. Schwann) through which it is diffused. It has been stated, that the presence of bloodvessels in the cornea, the anterior half of the capsule of the crystalline lens, and in the substance of the lens itself, appears to be incompatible with their function of transmitting the rays of light to the retina. Nevertheless large vessels ramify on the posterior half of the capsule. The knowledge of the existence of this arrangement of vessels led me to perform some experiments with lenses, from which I have deduced the fact, that objects (radiating lines, for instance) situated on the *anterior* surface of the crystalline lens, produce an indistinctness in the image which is formed upon the retina; whereas, when these lines exist upon the *posterior* surface of the lens, the image is perfectly clear.”

Mr. Bowman, in the treatise on Physiological Anatomy by him and Dr. Todd, observes—“The body of the lens is constructed in a manner calculated to excite admiration. Its superficies by which it comes into contact with the capsule consists of a layer of extremely transparent nucleated

cells. These cells form an organized connecting medium between the body and capsule of the lens, and there is no interspace unoccupied by them. After death they very soon become loaded with water (absorbed most probably by the capsule from the aqueous humour), which is the *aqua Morgagni* that some have supposed to exist naturally between the capsule and the body of the lens." Notwithstanding these inquiries respecting the vitality of the lens, the nature of its connexion with its capsule, and its nutrition, I find in an article on the Anatomy of the Eye by Dr. Hays of Philadelphia, the old opinion of an *aqua Morgagni* maintained. He repeats the description given in all the common books on anatomy, that "when an opening is made into the capsule, a minute portion of water escapes which is called the *aqua* or *aquula Morgagni*;" and adds, that "the existence of this fluid has been denied, and Dr. Jacob *seems* to entertain doubt on the subject." It is evident, however, from the above quotation, that I entertain no doubt about it, but on the contrary am quite satisfied that *Morgagni* was mistaken. Dr. Hays also says—"Dr. Jacob also calls in question the commonly received opinion that there is no direct connexion between the lens and capsule. He *attempts* to show that they are organically connected. He adduces, however, no direct proof, and the facts on which his arguments are grounded admit of different explanations from those he has assigned." I do not find, however, these explanations set forth. I have distinctly stated the method by which the connexion between the lens and its capsule can be *demonstrated*, and I have a hundred times demonstrated it in my lectures. At the same time, the observations of microscopic observers above quoted confirm my view, and set the question at rest. Those seeking what is called practical information, will perhaps think that I have dwelt too long on this matter; but convinced as I am that sound anatomical and

physiological principles constitute the only foundation upon which surgery can rest, I have thought it necessary to establish those principles in the present instance. If the crystalline lens has no organic connexion with the capsule which contains it, and lives or grows by the simple imbibition of a fluid in which it is immersed; or if, as Dr. Müller of Berlin seems to say, it is "secreted" by the capsule, then does it afford a signal example of vital existence maintained by means at variance with the law which we have been led to believe governs nutrition in general; in other words, it is a physiological anomaly which must weaken our confidence in established doctrines.

Be the vitality and organization of the crystalline lens, however, what it may, my present object is to inquire whether it is ever the seat of inflammatory action, and if so, to demonstrate the effects of that process upon it. To prove that a distinct, insulated, inflammation of this body, commencing in it and confined to it, ever takes place, is, I confess, a task which I do not propose to undertake. I cannot, as I have done in the case of the cornea, show that red vessels make their appearance in the body of the lens, or that purulent matter is formed in its texture, in consequence of inflammation originating in it and restricted to it; I cannot, in fact, demonstrate that a species of inflammatory disease of the eye, entitled to the denomination of *Lentitis*, ever takes place. I can, however, show that this body becomes involved or implicated in general inflammation of the eyeball, whether commencing in the iris, and hence called iritis, or in the retina, and hence called retinitis; and in the sequel I may perhaps show the possibility, if not the probability, of the occurrence of some internal action in it equivalent to inflammation, causing changes destructive to its organization and functions. Dr. Mackenzie, in his work on Diseases of the Eye, adopts the views of Dr. P. F. Walther, who, in a work entitled—

“ *Abhandlungen aus dem Gebiete der practischen Medicin*, published at Landshut in 1810, describes the symptoms and consequences of inflammation of the lens, or indeed rather of its capsule; and I do not think I can better explain these views than by quoting here Dr. Mackenzie's abstract. He observes:—

“ The appearances which are presented by this disease have been minutely described by Professor Walther, and from numerous opportunities, I am enabled to verify, to a certain extent, the accuracy of his description.

“ He states that inflammation of the crystalline capsule generally occurs about the middle of life, and in subjects of a slight cachectic disposition. This is certainly true, although in more than one instance I have seen such severe inflammation of the capsule in young children, that the part appeared to the naked eye completely loaded with red vessels, a state not unfrequently observed in the horse, but which I have never seen in the adult human subject.

“ The anterior hemisphere of the crystalline capsule, deriving its bloodvessels from the arteries of the ciliary processes, while the posterior is nourished by the artery of the vitreous humour which is a branch of the central artery of the retina, is frequently met with in a state of inflammation, while the posterior seems free from disease.

“ Inflammation of the anterior hemisphere of the capsule occurs oftener in light eyes than in dark, and is always accompanied by a slight change in the colour of the iris and form of the pupil, the iris becoming a little darker, and the pupil irregular. The motions of the iris are at first lively and extensive, but subsequently become sluggish and very limited. The pupil is generally smaller than in the sound state, but sometimes it is irregularly dilated. There usually appears a black rim of irregular breadth all round its edge, arising from the pigmentum

nigrum of the posterior surface of the iris coming into view. Along with these symptoms, a number of red vessels appear in the pupil itself, the largest of which are in some instances visible to the naked eye, but the greater number distinguishable only by the aid of a magnifying glass. What at first merely appears a red point, assumes under the glass, the appearance of a delicate tissue of vessels. The red vessels in inflammation of the anterior hemisphere of the capsule, always constitute a sort of vascular wreath, observed at about a quarter of a line's distance from the pupillary edge of the iris; this wreath forms a concentric circle within the pupil, and is found on examination to consist, not of one or a few vessels circularly disposed, but of a number of vascular arches. To this vascular wreath there run in a radiated form, numerous vessels from the circumference of the capsule. Other vessels seem to extend from the delicate membrane retaining the pigment of the iris in its place; but such are not constantly present. It is only in cases where the disease has lasted some considerable time that they appear. In other cases, according to Professor Walther, vessels seem to be prolonged rather from the capsule into the posterior surface of the iris. Those which run from the iris to the capsule, never arise from the edge of the pupil, but at a little distance from it, on the posterior surface of the iris, so that nearly a line's breadth next the pupillary edge is free from these vascular sproutings. From the vascular wreath already mentioned, vessels are seen spreading towards the centre of the anterior capsule, and there again forming clusters and arches. Although the continuation between the vessels, seen in different parts of the pupil, seems interrupted at some points, yet there can be no doubt of their being continuous. From their extremely minute size they can be distinguished only where enlarged and clustering together.

“Inflammation of the posterior hemisphere of the crystalline capsule is a much rarer disease than that of the anterior. It is easily recognized by the deep situation of the opacity which it presents, and the stellated arrangement of the enlarged vessels. Both hemispheres of the capsule may be inflamed, in which case behind the red vessels, seen in the anterior capsule, there appears a network of more delicate vessels, which seem to be seated in the lens itself. The larger trunks of this network evidently come, says Professor Walther, from its posterior surface, directly forwards, and then divide into branches. There can be no doubt that these are the ramifications of the central artery of the vitreous humour, spread out upon the posterior capsule.

“As *the lens* undoubtedly derives its nourishment from the capsule, it is not to be wondered at, that when the latter is inflamed, enlarged vessels should be seen prolonged into the former. Professor Walther, however, is of opinion that the existence of vessels passing into the substance of the lens is entirely morbid, and he compares it to what occurs in inflammation of the thorax, when vessels are prolonged from the pleura to the pseudo-membrane formed on its surface. He says, that as the vessels of the anterior hemisphere of the capsule shoot forwards into the posterior surface of the iris, so they shoot backwards into the lens itself; and that the same holds good with respect to the posterior hemisphere of the capsule, which being more copiously supplied with bloodvessels, it is explained how the largest vessels of the inflamed lens are seen to come from behind forwards. It would appear also that all inflammations of the lens begin in the capsule, a fact which Walther considers as analogous to the spread of inflammation from the ciliary processes or from the iris to the capsule.

“At the apparent terminations of several of the vessels

in the capsule, there are distinctly perceived little knots of a whitish-gray semitransparent substance. This is evidently coagulable lymph, and Walther considers its presence as disclosing the manner in which inflammation of the capsule and lens produces opacity of these parts. The anterior hemisphere of the capsule, where the vessels are very numerous, sometimes assumes a peculiar velvety or flocculent appearance, and in one or more spots of its extent presents a gray or brownish colour. These brownish spots appear in some instances to be nothing more than effused lymph; but in other cases they probably owe their origin to the iris having been united to the capsule by partial adhesions, which being separated either by more extensive spontaneous motion of the iris, by mechanical violence, or by the sudden influence of belladonna or some similar narcotic, part of the pigment of the iris has remained adherent to the anterior surface of the capsule.

“It is a fact, strongly confirming the accuracy of Professor Walther’s account of inflammation of the crystalline capsule, that in anterior capsular cataract, the specks or streaks generally radiate from the edge of the anterior hemisphere of the capsule towards its centre; while in posterior capsular cataract, they evidently branch out from the centre of the posterior hemisphere, following thus both the natural course of the arteries, and the directions of the inflamed vessels as represented by Professor Walther.

“As to the state of the patient’s vision who is affected with inflammation of the lens and capsule, it is indistinct and confused, where the disease is severe, particularly when the eye is directed towards distant objects. Near objects are seen as if through a fine gauze. This does not seem red, nor are objects tinged of that colour.

“This ophthalmia always observes a chronic course. It proceeds very slowly, and is attended with little or no pain. When pain does attend this disease, it is seated at

the bottom of the orbit, in the forehead, or in the crown of the head. When the disease has continued for some considerable time, the bloodvessels in the lens and capsule become varicose and remain so permanently. Walther observed the vessels of the lens in a middle-aged man to remain in a varicose state for a whole year, without undergoing the least alteration. I have seen this disease followed or accompanied by incomplete amaurosis, complicated in one case with tremulous iris. Effusion of fluid between the lens and capsule, and dissolution of the former, are not unfrequent consequences of inflammation of these parts; while in other instances, the disease would appear to go the length of suppuration, for we must consider inflammation as the cause of that variety of cataract which is called *cataracta cum bursa ichorem continente*, the opaque state of the lens and capsule being complicated with the presence of a cyst contained within the capsule and filled with pus.

“The causes of this ophthalmia have not been sufficiently investigated. In one case which came under my care it affected the right eye of a keen sportsman, and might perhaps have been connected with the over-excitement which the eye must have undergone year after year at the shooting season.

“Inflammation of the lens and capsule approaches nearer to iritis than to any other ophthalmia. It is, however, much less acute in its character, and greatly less under the influence of treatment.

“Depletion, counter-irritation, and alteratives, are the remedies which suggest themselves as most likely to do good in the early stage of this disease, and tonics in the latter stages. In the acute stage, I have sometimes succeeded completely in curing inflammation of the anterior hemisphere of the capsule. In a case which I treated lately, on the first day of my being called, two minute reddish

spots were seen projecting from behind the edge of the pupil. Next day there were five. In the course of a week, the symptoms totally disappeared, under the employment of venesection, leeches, calomel with opium, and belladonna. The mouth was made very sore. In the chronic stage, however, I must confess that this ophthalmia has in my hands proved one of the most obstinate. Cases, generally mistaken and treated for iritis, have been sent to me for consultation, in which a long-continued use of various remedies, including mereury, had been productive of no effect."

Notwithstanding these observations, my belief is that no insulated inflammation of the capsule and lens, originating in the part and confined to it, so as to constitute a distinct variety or species, and to be enumerated in a nosological arrangement under the title of *lentitis*, ever takes place. What Dr. Walther describes appears to me to be a not unusual effect of general inflammation of the contents of the eyeball, with perhaps a little colouring, and such accuracy of description as the establishment of a new species of disease perhaps demands. That the capsule of the lens, and in many cases, ultimately, the lens itself, becomes implicated in the general inflammation of the eye commonly called iritis, there can be no doubt, and this I am of opinion it is that Dr. Walther has been describing. Dr. Maekenzie says—"Inflammation of the anterior hemisphere of the capsule is always accompanied by a slight change in the colour of the iris and form of the pupil, the iris becoming a little darker and the pupil irregular, while the motions become sluggish and very limited." Surely this is to say that the disease is accompanied by iritis, or coëxists with it. He also says, that "red vessels appear in the pupil itself;" and that "other vessels seem to extend from the delicate membrane retaining the pigment of the iris in its place;"

adding that, according to Professor Walther, "vessels seem to be prolonged rather from the capsule into the posterior surface of the iris:" all which proves that the inflammation described extends from the iris in protracted or chronic inflammation of the eye, and especially in persons of rheumatic or serofulous habit, where there have been frequent relapses, the margin of the pupil almost always forms extensive adhesions to the capsule of the lens, in which adhesions red vessels, visible to the naked eye, are often observed; but these red vessels are not derived in the first instance from an inflamed lenticular capsule, but from an inflamed iris. Of the "much rarer" "inflammation of the *posterior hemisphere* of the crystalline capsule," I do not venture to give a very decided opinion, not having been fortunate enough to see many cases presenting appearances resembling those described. I will not deny that "ramifications of the central artery of the vitreous humour" may not "spread out upon the posterior capsule;" but I cannot say that I have seen them; and as to the "little knots of a whitish-gray semitransparent substance, evidently coagulable lymph," I am equally uninformed from my own observation. I may venture to add that it appears to me remarkable, that with all this inflammatory disorganization of the posterior hemisphere of the capsule, the lens should remain so transparent as to admit of a perfect view of them, and I am almost inclined to suspect that in some cases at least the appearances described are owing to certain curiously formed opacities which are sometimes to be seen in this structure or in the back of the capsule, constituting a peculiar form of cataract.

While I express doubts as to the occurrence of a distinct insulated inflammation of the crystalline lens, I do not, however, mean to deny that this structure becomes implicated when either the entire eye or some of its parts are inflamed; on the contrary, my present object is to point

out how it is affected in the inflammations called iritis and retinitis. When the iris is inflamed, one of the most common effects of the disease is adhesion of the margin of the pupil to the capsule of the crystalline lens, and in inflammation of the membrane of the chamber of the aqueous humour the same frequently takes place. This adhesion, according to received principles, can scarcely take place without inflammation of the capsule of the lens also ; unless indeed it be assumed that the capsule is covered by a continuation of the membrane of the aqueous chamber, and that it is this membrane only which is inflamed. However this may be, there can be no doubt as to the formation of these adhesions, and with them of opacities of the capsule constituting a species of capsular cataract. Sometimes there is a general loss of transparency caused by an irregular net-work of gray lines like broken cobwebs filling up the pupil ; while at other times there are distinct, defined, white, and opaque points at the places of adhesion, not confined to the surface of the capsule, but occupying its entire thickness. When the inflammation has been protracted or chronic, or when there have been repeated returns or relapses of it, vessels carrying red blood visible to the naked eye become permanently established in the portion of opaque capsule encircled by the adherent pupil ; this, however, is not inflammation, but the consequence of it. Even in conjunctival inflammation, where the cornea sloughs or ulcerates, allowing the iris to become prolapsed, the inflammation in the anterior chamber caused by that occurrence extends to the capsule of the lens ; or if it does not, I cannot otherwise account for the minute, distinct, and sometimes elevated, opacity seen in the eyes of children who have suffered from infantile purulent ophthalmia, constituting a variety of the species of capsular cataract called central (*cataracta centralis*).

Having so far discussed the question of inflammation of

the capsule, and endeavoured to show that it does not arise in that structure, but is extended to it from other parts, I have now to inquire whether the body of the lens ever becomes inflamed, and if so, what are the changes it undergoes during the process. Of the inflammation of the body of the lens, which Dr. Walther describes, accompanied by the development of red vessels in it and the effusion of "little knots of coagulable lymph," I confess I know little. In fact, I do not believe that the appearances observed by him were of this nature, and if for no other reason for this: that such red vessels and "knots of lymph" could not exist without accompanying opacity of the part, which must have rendered such changes, if existing, invisible. I do not, however, mean to deny that the body of the lens is affected in inflammation of the eyeball in general, or of some of its parts; or even that it may be the seat of inflammation without corresponding disease of the adjacent structures: on the contrary, I have to remind the practitioner that opacity of the crystalline lens is a very frequent consequence of inflammation of the eye, and I conclude that such opacity is caused by the inflammatory action. In all cases of severe iritis, either neglected or intractable, and in which extensive adhesions have taken place between a contracted pupil and the capsule, complete opacity or cataract generally takes place; and in cases where the inflammation has been very severe and destructive, the lens is found not only opaque, but totally disorganized and converted into a white friable mass, contracted in size, and deprived of the lenticular form. This should not be forgotten by those who attempt to restore vision in such cases by an operation for artificial pupil, because the removal of the cataract is as essential as the opening in the iris. In fact, loss of transparency is the first and most remarkable change produced in the lens by inflammation, as it is in the cornea, and probably in all transparent structures. Not

only does loss of transparency, or in other words, cataract, take place in consequence of iritis or inflammation of the eyeball commencing in the anterior parts of the eye, but also in consequence of retinitis or inflammation commencing in the posterior parts. Many must have observed how frequently the lens becomes opaque, or as it is said, "cataract forms," in cases of what is called amaurosis in early and middle life, such cases being inflammation of the retina extending, probably through the vitreous humour, to the lens. Such cataracts generally display no very great amount of disorganization, being merely of slight and delicate opacity like a mixture of milk and water, and from their softness and obvious solubility tempt the surgeon to operate on them to the discredit of himself and his art, vision being lost in consequence of the original inflammation of the retina. How far the numerous and often curious varieties of cataract which are observed in early and middle life are to be attributed to inflammatory action, it is not easy to determine ; but seeing that cataract in the cases to which I have alluded undoubtedly are produced by this process, it is reasonable to admit that such varieties are so caused.

These inquiries conduct us to the resolution of this question. Assuming that loss of transparency is an inevitable consequence of inflammatory action involving the lens, can it be prevented, arrested, or removed by medical treatment? I believe the truth is, that it may be prevented and perhaps arrested in its progress, but not removed. If a case of inflammation of the eye, such as is commonly called iritis, be allowed to pursue its course without medical interference, it will probably terminate in contracted and adherent pupil, with cataract, and amaurosis or disorganization of the retina ; but if actively and judiciously treated, it will terminate without any of these bad consequences : consequently, here is the disease in the lens prevented or

arrested as it is in the iris and retina, and to this the practitioner must apply himself. Depletion, interruption of nutrition, mercury, antimonials, and every other resource as already enumerated, should be put in requisition, as much to prevent the lens from becoming opaque, or in other words, to prevent cataract from forming, as to prevent adhesion or contraction of the pupil, and loss of sensibility of the retina. In retinitis also, that slow, insidious inflammation commonly called anaurosis, not only may the disease be arrested in the retina, but prevented from extending to the lens, or if there already, may be arrested. The lens once become opaque cannot be restored to its original transparency, and hence the universally admitted incurability of cataract except by operation. Perhaps if the first approach of cataract could be detected, the progress of the disease might be arrested by appropriate treatment, but unfortunately the practitioner seldom sees the patient until the disease has made such progress that it cannot be remedied. Another example of the effect of inflammation in causing loss of transparency or cataract in the lens is afforded in injuries of the eye. Puncture by sharp points, such as needles or thorns, extending to the iris or into the vitreous humour, without touching the lens, are often during the consequent inflammation followed by opacity of that body; and therefore in the treatment of such cases has the surgeon to fear as much the formation of cataract as contraction and adhesion of the pupil or the disorganization of the retina, and therefore should he as much endeavour to prevent or arrest the one as the other. In inflammations of the eye of slow progress or prone to relapse, the retina often becomes disorganized, and consequently insensible, and the pupil permanently dilated; constituting the state to which the term *gutta serena* has been applied: but if either from the influence of gouty or rheumatic diathesis, or from some other constitutional de-

rangement, the disease is rendered still more destructive, the lens participates in the mischief, and becomes altered in structure and colour. Hence, in my opinion, the state of the organ which has been entitled *glaucoma*, but which has been, I believe, considered to depend upon other changes, such as alterations in the structure of the vitreous humour and retina. In concluding these observations respecting the question of an inflammation of the lens of specific character, I do not think it necessary to recapitulate the various remedial resources at the disposal of the practitioner to arrest the disease: they have already been repeatedly enumerated and their application explained when treating of other forms of inflammatory action. All I now consider necessary is to impress upon the practitioner the necessity of taking the crystalline lens into consideration when treating inflammation of the eye, and of inquiring, when investigating obscure cases of impaired vision, whether it may not be in his power to arrest incipient cataract as well as incipient amaurosis by judicious treatment.

ON INFLAMMATION OF THE EYE FROM INJURY.

AFTER the full consideration given in preceding papers to the various species, varieties, and modifications of inflammation of the eyeball and its component parts, it may appear superfluous to dwell upon that which follows injury; because it may be supposed that when treating of inflammation, which, from its uncomplicated character and freedom from the influence of constitutional derangement is considered specifically distinct from the other forms and hence is named idiopathic, everything applicable to inflammation caused by injury has been stated. But this is not the case, for the principal object of this communication is to point out the various characters assumed by inflammation from the same amount of injury inflicted on similar structures, and to show that they are as different as those produced by peculiar constitutional influence. Practitioners appear to think that all injuries of the eye are to be similarly treated, and that nothing more is necessary than to proportion the treatment to the amount of injury: they seem to assume that in all cases depletion, purgatives, denial of food, antimonials, mercury, and other usual remedies, are to be adopted, and that all they have to do is to consider the amount or extent to which they should be carried. This is a great mistake, for the destructive processes of inflammation are in many cases greatly disproportioned to the injury sustained: a scratch or puncture of the cornea will often cause destruction of the entire eye, while an extensive wound, even with laceration and contusion, will sometimes be repaired without extension of the consequent inflammation to the parts untouched. So far from considering inflammation of the eye when caused by

injury, to be of more simple, uncomplicated, or uniform character, I look upon it to be the inflammation which affords most frequently examples of peculiar modification or specific peculiarity. It will be intense in its nature and rapid in its effects, or languid in its action, and slow or chronic in its progress : or it will assume the rheumatic, neuralgic, or scrofulous character ; and even when latent syphilis is present in the system, it may be influenced by that poisonous influence. This may appear to some an assumption unsustained by facts, but of its truth I entertain no doubts : I have too often seen these modifications of inflammation following accidental injuries and operations to be at all undecided on the subject. Even what may be considered the extreme case amongst them, the syphilitic species, I am convinced sometimes occurs ; because I have so often seen true syphilitic iritis attributed by patients to slight accidents, and I believe on just grounds, that I cannot but admit the possibility at least of such combination. Indeed the question may be fairly mooted whether syphilitic iritis may not be in all cases an inflammation from ordinary causes modified by the constitutional syphilitic diathesis, rather than a local concentration of the disease displaying its distinct and peculiar specific characters. This is, however, a speculation not to be dwelt upon here, and I have therefore to return to the subject more immediately under consideration : the nature, amount, and consequences of inflammation caused by injury. The first question to be determined in this inquiry may appear to some a novel one, and yet it is one which should be settled. Is inflammation a necessary and inevitable consequence of injury of the eye ? That it follows from contused and lacerated wounds or deeply penetrating punctures must be admitted ; but that it always follows simple incised wounds remains to be proved. We are, I believe, indebted to the late Dr. Macartney for suggesting this question to surgeons with refer-

ence to injuries in general, in his work on Inflammation ; and I am satisfied of the correctness of his views from observation of injuries of this organ. This inquiry, however, cannot be entertained here : it is sufficient for the present purpose to assume that practitioners not only no longer consider some inflammation necessary for the reparation of injury, but that they consider it necessary to adopt every measure and precaution to prevent or arrest that process. Not only have they arrived at this conclusion, but in my opinion they proceed under an exaggerated notion of its importance. They appear to think, as I have already said, that every wound of the eye, however slight, demands what is called active treatment, and that severer injuries require extraordinary measures. According to my experience, wounds of the eye are followed, either by no inflammation ; by suppuration, if it is the cornea which is injured ; by common or ordinary inflammation ; or by a slow disorganizing species of inflammatory action, sometimes modified by rheumatism or serofula, or other constitutional disease.

When the cornea is punctured, as it sometimes is, by a needle, the prong of a fork, an awl, or a thorn ; or when it is cut by the point of a penknife, broken glass, or fragments of stone or metal, the surgeon has nothing to do in the way of manual operation ; but if the wound be large, and especially if it be a lacerated one, and extending through the iris, or allowing that membrane to prolapse, he has then to adjust the divided edges with a blunt probe, or the instrument called a curette, and to replace the iris, if possible, by gently pressing it back. Having done this, he should consider what means he has at his disposal in the way of local application to prevent or allay inflammatory action. The eye is, I believe, in such cases generally bandaged up, with or without what is called, and perhaps appropriately, a "compress," wetted with some lotion.

This is bad practice. The surgeon has two objects to attain by his dressing : to prevent mechanical irritation by friction of the lids, and to keep the parts cool by evaporation. To effect this, a single layer of soft old linen wetted with cold water, is all that is necessary ; but if the patient be obliged to move about and to attend to business, it is not easy to make such an application without pressure. I use an oval piece of old linen sufficiently large to cover the parts from above the eyebrow to the cheek, secured with strings of tape, and direct the patient to keep it constantly wet by squeezing a sponge or rag dipped in cold water over it. With working men, who are generally the subjects of such accidents, I am, however, often obliged to sacrifice the advantage to be derived from evaporation, in consequence of their being unable to keep the linen wet, and am compelled to rely on the mere interruption of motion of the lids, with the relaxation of surface secured by moisture. With this view, a scrap of oiled silk lined with old linen, and wetted when it becomes dry, is substituted for the evaporating application. In greater injuries of the eye more precautions must be adopted. When the cornea is extensively divided, with or without division or prolapse of the iris or injury of the lens, the local treatment must be the same as that employed after the extraction of a cataract : both eyes must be kept closed to prevent the separation of the lips of the wound by the motion of the eyelids, while temperature is to be lessened or its increase retarded by water-dressing. With this view something in the shape of bandage must be employed, although from the pressure it causes, it is generally to be avoided. I lay one layer of old linen about three inches wide across both eyes, and instead of securing it in its place by passing it round the head or pinning it to a cap, by which unequal pressure is produced, I have it touched at the ends with a little adhesive plaster, and by this means cause it to adhere to the

temples, and by similar means to the forehead, just above the nose. This layer of old linen I direct to be constantly wetted with cold water where it touches the eye. After the second day, I merely cause seraps of wet linen to be laid over the eye, and as they become dry during sleep at night, I allow them to fall off at that time. If there be danger of the iris becoming entangled in the wound, or during the subsequent healing adhering to it, a belladonna lotion should be substituted for plain water, and the lids and brow should be painted with the extract once in twenty-four hours. If severe inflammation comes on, indicated by intense redness of the sclerotic and discoloration of the iris; and in cases where the cornea has been injured, accompanied by suppuration, cold-water dressing, or mere interruption of the motions of the eyeball and lids, will not be sufficient. Such a state is attended by severe pain, and demands a trial at least of warm applications in the shape of stupes or even poultices. These will not always relieve pain or reduce inflammatory action, but it must, I think, be admitted that they often have a soothing effect, and that their application is often followed by a diminution of the increased vascularity and reduction of any tumefaction which may have taken place. It is not easy to reconcile the theoretical explanations given of the effects of two such opposite agents as heat and cold, but it must be admitted that they are both found beneficial in the treatment of inflammation, and I have no doubt that they are useful in inflammation of the eye from injury or other cause.

In severe wounds of the eye, the surgeon has at first to deal with the peculiar accidents which must be found where an organ of such complicated structure is the seat of injury: union of the divided edges is to be secured, and a prolapsed iris is, as I have already observed, to be reduced; while foreign bodies are to be removed, or even the lens itself if displaced. Subsequently the proximate effects or conse-

quences of inflammation are to be encountered, such as abscess in the cornea, and, as I have already said, adhesions of the iris to the capsule of the lens. Foreign bodies should, if possible, be removed, but they may have been driven so deeply into the eye, or so entangled in the iris, that much manual and instrumental interference may be necessary. Small particles of iron, brass, stone, or other material sticking in the cornea, must be removed at once with the point of a needle, and I am convinced that no needle is better suited to the purpose than that which I use for operating on a cataract. Larger pieces may require the use of the forceps or curette for their removal, and it may be necessary to follow them into the interior of the eye, and even to enlarge the external wound. This must, however, be done with great caution, as the lens, if not already injured, may be wounded, or the iris may be cut or torn, and the vitreous humour forced out. There may also be more difficulty in removing such fragments than the operator may at first suppose, as they may be entangled in the folds of the iris, which becomes flaccid when the aqueous humour escapes, or they may be lodged in the lens or vitreous humour. If the crystalline lens has been wounded, and especially if it has been detached from its capsule and thrown forward against the iris, or in front of it, it should, if possible, be removed, broken up, or depressed. It never should be allowed to remain in the anterior chamber, especially in aged persons, but should be extracted, depressed, or reclined, because it swells from imbibing the aqueous humour, or if hard, remains undissolved for many months. These operative means of relief must, however, be employed immediately after the infliction of the injury, as they can scarcely be resorted to after inflammation has set in.

The local treatment of the proximate effects of inflammation following injury sometimes is of considerable im-

portance. Abscess of the cornea often follows slight punctures or scratches of that structure, as from foreign bodies and the removal of them. The practice of opening such abscesses has been questioned, but in my opinion it is as necessary to give exit to matter in this situation, in order to prevent extension of the injury, as it is in other situations. Matter secreted into the chamber of the aqueous humour, if small in quantity, as where it constitutes hypopion, requires no opening for its escape: it will be absorbed sooner or later; but if it accumulates in such quantity as to fill the entire chamber and to cause distension, it should be discharged. Sometimes when it is formed in the cornea it is diffused in its texture, but more frequently it is lodged in a distinct cavity, and in this case, especially if large, it should be opened. This should be done with a keen extracting knife, and requires careful and delicate manipulation; a common lancet is a very awkward instrument for the purpose. The surgeon, however, must be prepared for consequences apparently caused by his interference. The parts become so much thinned by the supuration that an opening takes place into the anterior chamber, and the iris prolapses; but this is a consequence which does not cause loss of vision, unless the opening be very large and the portion of the iris protruded very great: smaller prolapses of the iris are followed by irregular and eccentric pupil only. This prolapse should not be attributed to the opening of the abscess; that operation probably often prevents this mischief if done in time, or if it does not prevent it, renders it less destructive. It is usual to touch the little tumour formed by this prolapsed iris with nitrate of silver to reduce its size and to allay the painful sensibility of its surface. This I do not consider necessary, because when small, it shrinks to a level with the cornea in healing, and when large, it is better to allow it to become firmly adherent to the opening through which

it has passed, and somewhat consolidated before interfering with it. After the inflammation has subsided, it may, before or after cicatrization, be punctured or even freely opened should it create uneasiness or deformity from its size or prominence, which causes it to fall flaccid and ultimately to contract: it is often, however, necessary to repeat the puncture several times before this object is accomplished.

The general or constitutional treatment of inflammation of the eye from injury is still more important than the local management. Destruction of the organ takes place either from the suppuration to which I have alluded, or from the inflammation extending to all its parts, and causing cataract or amaurosis, or both, with or without contracted and adherent pupil. The suppuration with its consequent ulceration, affords a most instructive lesson to the surgeon, displaying as it does the influence of constitutional derangement on local inflammatory action. When slight injuries of the cornea are followed by this effect, it is obvious that it is not the amount or extent of the wound which causes the greater mischief, but some condition of the system which alters the ordinary operations of the animal economy. Destructive ulceration or abscess is, I think, uniformly accompanied by obvious derangement of the digestive, assimilating, and nutritive functions. The tongue is white, and often even brown in the centre, while the stomach is uneasy, and disturbed by flatulence and acidity. The fecal discharges from the alimentary canal are seldom examined in such cases, but if attended to will probably be found mixed with undigested food and deficient in the colour which the bile imparts to them in a state of health: the urine also affords evidence of gastric disturbance by a deposition of urates or uric acid: in fact, both from these symptoms and the aspect of the patient, as well as from the account given of his habits and dietetic irregularities, the

surgeon appears fully justified in assuming that the local mischief is aggravated, if not caused, by the constitutional diathesis. Abscess of the cornea or secretion of purulent matter into the chamber of the aqueous humour, whether from injury or irritable ulcer, I find almost uniformly takes place in aged persons, either of feeble frame or of that turgid habit of body which indulgence in the excesses of the table causes ; and in younger subjects who lead irregular lives, and are subject to great vicissitudes of diet and weather. In children the same consequence is observed in those badly fed, insufficiently clothed, and confined to impure atmosphere ; whether in the nurseries of the gentry or the close rooms and cottages of the poor. Keeping all this in view, the practitioner should, in my opinion, direct his attention in these cases where suppuration follows slight injury, to this state of the assimilating organs, rather than rely on depletion and mercury. I do not mean to advise that he should not bleed where a plethoric state of the system exists, or that he should not resort to mercury if the inflammation does not speedily yield, I only wish to inculcate that the destructive changes in progress in the organ will be best arrested by inducing a healthy state of the nutritive functions. To effect this he must begin by removing the contents of the intestines by purgatives, of which every one has his own form of prescription. If there has been no previous constipation, I find a dose of the compound colocynth pill, with two or three grains of calomel at night, followed by a purgative draught in the morning, sufficient ; but if there should be reason to suspect that there has been for some time an inactive state of the alimentary canal, I keep up the purgative effect by giving three grains of the same pill with one of calomel threetimes a day for a couple of days. The second day I commence with five grains of the *pilula hydrargyri* at night, followed by some bitter infusion, with alkali in the morning and middle of the day. A mix-

ture of infusion of quassia with about half an ounce of compound tincture of cardamoms, a drachm or two of aromatic spirit of ammonia, and half a drachm of bicarbonate of potash, appears to answer the purpose in ounce doses. Nutritive food of easy digestion should be given in moderate quantity, instead of the gelatinous broths and preparations of starch and sugar often given, and very appropriately called "slops." Even a small quantity of wine or other alcoholic beverage should not be denied to persons in the habit of taking them at or after dinner. All this, however, must be done according to symptoms, state of general health, and habits.

Wounds or other injuries of the eye, whether accidental or inflicted in operations for cataract or artificial pupil, are often followed by general inflammation of the eyeball, not very different from simple inflammation from exposure to cold, commonly called idiopathic iritis, and sometimes, as I have already observed, modified by constitutional disease or derangement of the nutritive functions. There will be the sclerotic vascularity, marginal opacity of the cornea, discoloration of the iris, contraction and adhesion of the pupil, cataract, and amaurosis, as in other forms of inflammation of the eyeball; and all this may be varied in appearance or consequences according to the state of the system at large. It may assume the scrofulous or rheumatic character, or it may display peculiarity of nature by its rapid progress and intensity, or by its slow and disorganizing operation: in fact, it differs so little in symptoms and consequences from the other forms that it is unnecessary to repeat what has been so often stated respecting treatment. It is sufficient to observe that bleeding, diminution of food, mercury, and so much of purgative medicine as may be necessary, are to be made available according to circumstances and in proportion to the activity and peculiarities of the disease; while bark, iodine, iron, and

other tonics and alteratives, are reserved for the subsequent stages. If the inflammation be of the simple or ordinary form, and the patient in good health, the treatment will be equally simple and sufficiently obvious. Depletion by abstraction of blood and denial of nutritious food will of course be necessary, and should be carried into effect according to the amount of the injury and the strength of the patient; but it should not be persevered in so as to interrupt or arrest the salutary processes of reparation. A single bleeding to lower the heart's action and to diminish the activity of the capillary circulation will, perhaps, be sufficient, followed by leeching in the vicinity of the part, if the symptoms and progress of the inflammation require it. The contents of the alimentary canal should be removed by opening medicine, but the continued administration of purgatives, as sometimes practised, cannot be necessary or beneficial. The quantity of food should be diminished, and its nutritious properties should, perhaps, be less than is required in a state of health, but it should not be composed of materials incapable of affording blood of healthy quality, such as any of the varieties of starch or gelatinous broths. I have already so often suggested the necessity of carefully adapting the administration of mercury to the nature and intensity of the inflammation and to the constitutional peculiarities of the patient, that it is unnecessary to return to the subject here.

In treating of inflammation of the eye from injury, the fact that such inflammation sometimes extends to the other eye should not be forgotten. The disease so propagated should even perhaps be noticed as a distinct species, or variety at least, of ophthalmia or iritis, in consequence of its origin, nature, and progress, and it is so considered by Dr. Mackenzie, who calls it *SYMPATHETIC OPHTHALMIA*, or *Iritis Sympathetica*. Whether or not it is to be attributed to what is called sympathy, or a certain participation in ner-

vous influence, it is unnecessary to discuss here; all that is required for practical purposes is to establish the correctness of the view which assigns the one inflammation as the cause of the other. Of this it does not appear that there can be any rational doubt: every surgeon of experience could probably verify the inference by reference to his own practice; indeed, the consequence has so often been observed that the wonder is its not taking place oftener, for fortunately it is not a frequent one. In treating severe injuries of the eye, and giving opinions and advice respecting them, it is therefore necessary to bear this in mind, in order that every measure adapted to the alleviation of inflammation and irritation should be adopted, and that the possibility at least of extension of the disease to the other eye should be pointed out to the patient.

This *sympathetic* inflammation is a general inflammation of the eyeball. There is the usual sclerotic vascularity, general haziness of the transparent parts, alteration in colour of the iris, and defective sight at first; followed by still greater change of colour in the iris, amounting to green or yellow tint, contraction, irregularity, and adhesion of the pupil, opacity of the lens and its capsule, and total loss of vision. How far this disease depends upon injury of some particular parts of the wounded eye does not appear to be settled. Dr. Mackenzie seems to think that it takes place most frequently when the ciliary ligament (*annulus albidus*) is injured, and that extensive lacerated wounds, including the iris, also provoke it. This is not improbable, considering the great number of nerves passing into these parts and the great vascularity of the iris; but the observation, in fact, means that great injuries which necessarily involve the iris and choroid membrane are more frequently followed by this consequence than smaller ones in which the cornea or sclerotic only are wounded. Such great injuries are not, however, so often

followed by this sympathetic ophthalmia as might be supposed from accounts given of particular cases; on the contrary, they so frequently occur without this result, that I am inclined to think it is to be attributed to some other cause than the mere wound or laceration. I believe that it arises more from constitutional diathesis than the local destruction, that it, in fact, takes place in consequence of the depletion, denial of food, confinement to the house or bed, and severe medical treatment resorted to for the original injury, and especially in subjects previously debilitated, or, as may be said, poisoned by tobacco, alcohol, and perhaps opium, habitually consumed, and living without properly cooked nutritious food, pure respiration, or regular bodily exercise. It has, I believe, been most frequently observed amongst besotted "operatives" and idle young men who abandon themselves to sensual enjoyments and an irregular life, as well as amongst young persons of either sex, badly fed, clothed, and lodged. Specific constitutional disease, especially scrofula and rheumatism, or even syphilis, are probably predisposing causes, and greatly influence the progress and consequences of the disease. This view is strengthened by the fact that in all injuries of the eye, as well as in operations, the amount and effects of the inflammation are not at all in proportion to the extent of the injury or division of parts, but evidently depend upon some state of the system which cannot be detected at the time.

The sympathetic inflammation generally comes on in the uninjured eye in about a month or six weeks after the accident, and generally in cases where the injury in the other has been mismanaged or neglected, and where the consequent inflammation has not been subdued, or has returned after subsiding. It is usually of destructive character, and accompanied by effusions, opacities, adhesions, and other disorganizations, causing discoloration and loss

of contractile power in the iris, adhesions, and closure of the pupil, cataract, and amaurosis. The surgeon must, therefore, not only give a guarded prognosis respecting it when it does occur, but in all severe injuries of an eye must warn the patient that such a result may follow disregard of proper precautions. It has been observed by Dr. Mackenzie, that this inflammation does not follow operations for cataract, and I have I think found it so, although I cannot say that such is always the case. This is, I believe, because the patient seldom throws off all restraint, or resists all control or treatment, as he often does when he finds that an eye is irreparably destroyed by accidental injury. Inflammation after the operation of extraction, or after the old and destructive operation in which the lens is broken up or depressed through the sclerotic coat, is always treated more or less carefully from its commencement, and thus is the danger of sympathetic inflammation of the other eye diminished. This point is not unworthy of observation when it is recollected how often patients anxiously inquire whether any danger is to be apprehended to the other eye from an operation on the opposite one, and how necessary it is to qualify an assurance of safety in that respect by a warning as to the consequences of exposure to weather or irregularity as to food or habits. Although the prognosis in cases of sympathetic inflammation of the eye must be unfavourable, the surgeon should not despair of success if well-directed efforts to save the organ be steadily continued. It is also to be borne in mind respecting it, that notwithstanding its destructive effects on the iris and lens, the retina escapes destruction in its progress more frequently, perhaps, than in other inflammations of the eyeball, unless the disease causes total disorganization, with irregularity in form, of the entire globe. I operate for artificial pupil on eyes which have suffered from severe injury, or this sympath-

tic inflammation, with more confidence than upon those having the pupil closed by the other species of disease.

The treatment of sympathetic inflammation of the eye requires an accurate estimate of symptoms and remedies. There is no empirical or specific cure for it, but rather a judicious dietetic and medical correction of an unhealthy state of the nutritive function. Food of nutritious quality and easily digested should be given in moderation, and removal from the bed-chamber to a well-ventilated room of uniform temperature should be enjoined, if the patient has been confined for some time to one apartment. Even change of air should be resorted to, and gentle exercise abroad, if the season permits. The medical treatment must depend very much on the previous treatment of the inflammation which followed the original injury of the other eye. Depletion by abstraction of blood will not probably be called for; purging, except in moderation and merely for the removal of accumulated intestinal contents, if any such there be, may be necessary; and correction of acidity of the stomach, as indicated by urinary deposit, should be effected. Mercury, if previously given to the extent of affecting the constitution, can scarcely be again administered with advantage, unless a considerable period has elapsed since its discontinuance; its character as a remedy in inflammation, however, stands so high that the practitioner can scarcely refrain from returning to it, should it appear probable that its influence has ceased to operate. If simple debility from interrupted nutrition and severe medical discipline suggests such a course, those preparations of cinchona or quinine best adapted to the stomach and system at large must be given: and if a scrofulous or rheumatic diathesis be present, suitable specific remedies must be adopted. Iodide of potassium should have a fair trial, either alone or in combination with bark, and even colchicum, should there be

evidence of rheumatic or gouty constitution. Turpentine may also have a trial. Locally, belladonna smeared on the skin round the eye, and its effect maintained by a lotion containing the extract, may, with safety, and perhaps advantage, be applied ; although during the inflammation the iris may not yield to its influence. Blisters to the temple appear to be more efficacious in cases of this kind, where the inflammation is of slow and remitting character rather than active and unabating.

It seems to be suggested, although not perhaps unequivocally recommended, to cause total destruction of an injured eye, when sympathetic inflammation of the other eye ensues. No sufficient evidence is, however, on record of the value of such a violent proceeding, the arguments in favour of it appearing to be founded on the assumption that the removal of a foreign body lodged in an injured eye has prevented, if not arrested, the inflammation of the other ; and upon the practice of farriers who, in the intermitting ophthalmia of horses, attempt to save one eye by the destruction of the other. That a foreign body lodged in an injured eye should be removed, even at the risk of producing the deformity which attends total shrinking of the eyeball, there can be no doubt : if it be visible, the cornea must be freely divided as in the operation of extraction, and the curette or forceps boldly used ; and if invisible, even the extirpation of the eye may be necessary. To “lay open” an eye with the view of causing its entire destruction by suppuration, because it continues in a state of irritation or even chronic inflammation, while the other eye suffers from sympathetic inflammation, does not seem to be justified either by theory or practice. Sympathetic inflammation does not appear to ensue from the amount of injury or inflammation of the wounded eye, but rather from a combination of local and constitutional causes, and often comes on after the first mischief has

ceased to operate: it is caused, it is true, by the injury and its consequences, but once set up it is probable that it cannot be allayed by any such expedient as this. It is also to be recollected that opening the eyeball to cause suppuration and discharge of its contents, as sometimes must be done in cases of prominent staphyloma, is often followed by most formidable tumefaction and inflammation, involving the entire contents of the orbit; and continuing quite long enough to exasperate a sympathetic inflammation.

ON PHLEBITIC AND PUERPERAL INFLAMMATION OF THE EYE.

To render more complete the account I have been giving of the inflammations of the eye, it is necessary to allude to a species or variety which, although not of frequent occurrence, is very distinct and remarkable in its nature. This is the highly destructive inflammation which sometimes attacks this organ, as it does other parts of the body, when inflammation of the vein follows bleeding, or when other local injury is followed by inflammation in remote parts, or when similar consequences take place during the puerperal period. It is not expedient to consider here whether or not this diffusion of inflammation is in all cases owing to inflammation extending through the venous system, it is only necessary to show that, in some cases at least, the inflammation of the eye is an obvious consequence of this state of disease. Dr. Mackenzie, in his work on Diseases of the Eye, devotes a chapter to the subject, and calls the species or variety "Phlebitic Ophthalmitis," and the facts recorded establish the conclusion that when veins become inflamed from the wound inflicted in bleeding, or from the application of a ligature, or from injury during surgical operations, the eye is liable to become inflamed, and

also to become engaged when venous inflammation takes place in the puerperal period, or even without any apparent local cause. Several examples of such inflammation have been recorded. In a communication on the secondary effects of inflammation of the veins by Mr. Arnott, published in the Transactions of the Medico-Chirurgical Society of London for 1829 (vol. xv.), the following are given :

“ John Dodging, æt. 35, had a portion of a varicose vein excised from the right leg on the 25th of June, 1828. The vein was a branch communicating with the posterior saphena. The following day he was attacked with sickness and vomiting, of greenish matter ; his pulse rose to 120, with symptoms of inflammation along the thigh of the operated limb. On the 28th, there was pain in the epigastrium, great sickness, difficulty of breathing, and restlessness. 30th. The left arm exhibited tension and other symptoms of phlegmonous erysipelas. On the 1st of July, the inflammation of the right leg had in a measure subsided ; difficulty of breathing and pain in the epigastrium still present ; the arm continues swollen and painful, as also the other leg, but less than on the previous day. 2nd. Pain and tension in the head, with dry and brown tongue, and depression of power both mental and bodily. 3rd. The patient evidently sinking ; the pulse fluttering, variable, and very frequent ; the skin deeply jaundiced ; the cornea of both eyes opaque ; the vessels of the conjunctiva injected ; the eyes constantly closed ; the patient, though deprived of sight and in a great degree of sense, was still able to recognize the voices of those who spoke to him, and could by a strong effort open his eyes and put out his tongue when desired to do so, the latter being dry and nearly black ; he died on the 4th. *Dissection* : Inflammation had extended to and along the posterior saphena as high as the ham, where it terminated abruptly ; in this course the vein was partly

plugged with lymph, and in places contained pus. Several smaller muscular branches contained fluid pus. Deep seated abscesses had formed beneath the fascia of the left forearm and leg, separating the muscular fibres to a considerable extent; in the right forearm there was also sero-purulent effusion between the muscles. No diseased appearances were found in the abdomen. In the chest, a small abscess, evidently the product of recent acute inflammation, was found in the superior lobe of the right lung. In the head there was considerable effusion into the cellular tissue of the pia mater, particularly towards the basis, and the serum in the veins was of a deep yellow colour. Lymph was effused around the trunks of the carotid arteries, the nerve of the third pair on the left side was evidently flattened and softer than that on the right; the nerve of the fifth pair on the right side had undergone a similar change to a greater extent. It has been remarked that during life, great opacity of both corneæ had taken place, the surfaces of which had become rough. On removing the right eye, destructive changes were found to have taken place within the globe, the crystalline was so soft as to yield to the slightest touch, the vitreous humour was of a reddish yellow colour, and red vessels could be distinctly seen traversing its membrane; the retina was of deep red colour.

“A young man had a ligature placed on the left carotid artery for an aneurismal disease of one of its temporal branches. Considerable difficulty was experienced in passing the needle round the vessel. Venous hæmorrhage took place during the operation, recurred at night, and occasionally afterwards, for nine or ten days. On the fifth day after the operation, the patient had a severe rigor, succeeded by heat of skin and general febrile symptoms. These increased, the pulse rose to 120, and the constitutional disturbance assumed a very violent character. About

the tenth day the vision of the left eye became impaired, and was quickly lost, the pupil was contracted, the iris immoveable, and the cornea had a somewhat hazy appearance; effusion took place under the conjunctiva, and the eyelids were greatly swollen, giving the appearance of the globe being much protruded; at the same time there was a degree of deafness, considerable stupor, with occasional slight delirium. In the course of a few days, the coats of the eye sloughed at the upper part, and its contents were evacuated. Whilst these changes were occurring in the eye, collections of matter formed without pain in different parts of the body, on both shoulders above the insertion of the deltoid muscles, over the sacrum, &c. The constitutional disturbance abated, the collapsed eye healed over, but he never recovered his health. Five months subsequently he died, labouring under lumbar abscess and worn out by hectic. On examination of the body (at which I was present), a portion of the jugular vein to the extent of two inches was found wanting; the upper and under extremities being shrunk, ligamentous, and gradually lost in the cellular substance. On opening the head, pus was found effused in great quantity between the tunica arachnoidea and pia mater, along the base of the brain, and the whole length of the spinal cord. The inter-muscular cellular substance of the loins was loaded with pus. The viscera of the abdomen and chest were not examined."

In the first of these cases there was inflammation of the divided vein for a short distance only; there is, however, no evidence that it had extended to the rest of the venous system, or that the inflammation of the eye was part of a general phlebitis: in the second, proof of general inflammation of the veins is also absent. There were, it is true, inflammations and abscesses in parts remote from the injury, but they appear to have been the same which occur

in what has been called diffuse or diffused cellular inflammation, or what might be called erratic or metastatic, or perhaps erysipelatous inflammation. Mr. Arnott argues that the inflammation of the eye arose from the inflammation of the vein, because there was the constitutional disturbance and abscesses which attend phlebitis, but these appear to take place sometimes from simple injury without any venous disease. Dr. Mackenzie records the following cases :—

“Mrs. L., aged 60, previously very healthy, became affected with whitlow at the point of the index finger of the right hand, about the end of November, 1837. She said she had pricked the finger, and that it had afterwards been ‘poisoned.’ She described the pain as shooting occasionally from the finger towards the shoulder. The finger was laid open, and a few drops of pus were discharged. In the course of a few days, it was apparent that pus was lodged in the sheath of the flexor tendon, which was opened. This was soon followed by erysipelas over the whole forearm, ending in extensive suppuration. The forearm continued in a bad state for more than five weeks. It was repeatedly punctured, and disorganized cellular membrane was discharged by numerous orifices. About the middle of January, 1838, she began to complain of rheumatic pains in several of her joints, but without any swelling. She had never been subject to rheumatism, nor to synovitis. A few days after this occurrence, the erysipelas suddenly subsided, and she began to complain of dimness of sight, but without any pain in the eyes. The iris of each eye appeared inflamed, and the pupils were somewhat contracted and very hazy. In three or four days from the commencement of this affection of the eyes, there was a deposition of lymph observable at the lower part of each anterior chamber. I visited Mrs. L. on January the 26th.

Both eyes were then almost completely amaurotic. The capsule of each lens was opaque, and of a greenish hue. The pupils were irregular and contracted. These symptoms denoted the existence of inflammation, but their supervention had been unattended with pain; and in this respect the case differed from ordinary instances of iritis. Calomel and opium were given, so as to make the gums sore in a few days; leeches and blisters were applied; and extract of belladonna was used externally. On the 6th of February, nine days from the time when the sight became impaired, the left eye was greatly protruded, and the conjunctiva so much chemosed as to overlap the greater part of the cornea. The swelling was of a pale red colour, and covered with a gelatinous, or lymphatic, pretty firm exudation, which peeled off in the form of a membrane. The eyeball was very tense. I punctured it with a lancet, through the sclerotica. In about a week, the swelling had fallen, so that the eye retreated into its socket, and presented its natural size, but the rheumatic pains became much aggravated for several weeks. Vinum colchici, external rubefacients, &c., were liberally used, with little apparent benefit. About the beginning of April, the right eyeball became protruded, in a similar way as the left had been two months before, but not to the same extent. It subsided in about the same time, under soothing applications. The left eye afterwards became atrophic. Both remained totally amaurotic. In the months of June and July, the rheumatic affection abated considerably, and the general health improved, but the patient felt so much weakness in her back, that she could not walk without assistance. Several of the lumbar vertebræ appeared a little protruded.

“Stewart Bell, a weaver, aged 23, was admitted into the Glasgow Fever Hospital, on the 14th May, 1836, for scarlatina, and was dismissed cured in the course of a few days.

He was readmitted on the 1st of June. At his readmission he complained of acute pain in the left thigh and leg, much increased by pressure on the inner part of the thigh. Both the leg and thigh were swollen, but of their natural colour; the left arm was rigid, but not swollen, and pressure or motion produced slight uneasiness. He complained of pain in the joints; pulse 112, pretty firm; tongue furred, moist; bowels loose. He had had several rigors on the 24th of May, followed by headache, heat of skin, and urgent thirst; and on the 25th, the affection of the limbs commenced. He was ordered ʒss. of castor oil, with twenty-five drops of laudanum; gr. iss. of opium at bedtime; and twelve leeches to the thigh. 2nd. Considerably relieved by the leeching; urine drawn off by the catheter. Thrice a day two grains of calomel with five grains of Dover's powder. 5th. Typhoid eruption; delirium; œdema of the eyelids to a great degree; pulse 100; tongue brown and dry. 7th. Delirium continues; pulse 100; tongue much loaded; bowels slow. Six grains of calomel, with twelve of jalap. 8th. Pulse 120. Powders continued. 9th. Rigidity of both arms; delirium continues; pulse 120; eyes much swollen and protruding. Twelve leeches to head. Powders continued. 10th. Sinking; pulse 120; features sharp; during this day deposition of purulent matter was discovered in both eyes; died in the evening. 11th. *Inspection*: Dura mater thickened; and in the course of the longitudinal sinus, a small, rough, irregularly-shaped, ossified body, about the size of a split pea, was discovered. Brain softer than natural; lungs engorged, and the bronchi reddened; no disease in the stomach or intestines; no trace of pus in the veins; the eyeballs, which had previously been much protruded, had sunk nearly to their ordinary place in the orbits. *Left eye*: The cellular and adipose tissue surrounding the eyeball was indurated, swelled, and infiltrated with serum;

the cornea transparent; the sclerotic reddish, soft, and thickened, especially around the entrance of the optic nerve; the anterior chamber contained a reddish fluid, with some white flaky matter; the iris was thin and soft; it had contracted no adhesions; the lens and both layers of its capsule were transparent. In the *right eye*, there was a thin lamina of lymph lying in the lower part of the anterior chamber, parallel to the iris, and extending up to the pupillary margin.

“Daniel Maclellan, aged 35, was admitted into the Glasgow Eye Infirmary, under the care of Dr. Rainy, on the 7th of June, 1836. The bulbs of both eyes are of an intense red, much swollen, and projecting far out of the sockets, but still covered with the upper eyelids. The whole cellular membrane round the eye is œdematous; the lower eyelids swollen and everted; the irides have a greenish hue; the pupils are irregular, and are not affected with light; the right pupil is occupied by an opaque lens; the left presents a hazy whiteness; has no perception of light nor shade with either eye; thinks he has a very slight perception with left eye; this disease commenced about a fortnight ago, after an attack of severe pain in side of chest, for which he was bled profusely; pain has been frequently severe in the eyes, and is still occasionally troublesome above the orbits; pulse 116, soft; bowels rather bound; has been treated with leeching, blisters, scarifications, purgatives, and calomel and opium. Eight leeches to each eye. Eight grains of calomel and eight of aloes. 10th. Swelling of left eye greatly diminished, and vision improved; swelling of right continues. Ten leeches to right eye. 12th. Right eye still much inflamed. Leeches repeated to right eye. Pill containing two grains of calomel and one of opium morning and evening. 13th. The lids were carefully brought together by plasters, and a compress and bandage applied over the eyes. The swell-

ing of both eyes is much diminished to-day. Solution of four grains of nitrate of silver in one ounce of water. Three of the calomel and opium pills daily. 15th. Mouth a little sore. Two pills daily. 16th. Head to be shaved; blisters behind the ears. Twelve drops of vinum colchici at bedtime. 18th. Complaints of pain in left eye. Two leeches to left upper eyelid. 22nd. Pain in the left eye was relieved on the 20th; on the morning of the 21st, suddenly became insensible and expired. *Inspection*: The pia mater was rather more vascular than usual; a considerable quantity of serum under the arachnoid, and at the base of the brain. *Right eye*: The orbital cellular tissue was infiltrated with serum; it was indurated, and contained a collection of purulent matter, which projected under the conjunctiva, and communicated, by an opening on the under surface of the sclerotica, with the interior of the eye. The sclerotica was greatly thickened, and firmly adherent to the indurated cellular tissue around the entrance of the optic nerve. The choroid adhered firmly by its outer surface. The inner surface of the choroid presented traces of fibrinous effusion, and was completely detached from the retina by a collection of purulent matter, which also extended into the cells of the vitreous body, and communicated with the external abscess through the opening in the sclerotica already mentioned. The retina and hyaloid membrane adhered firmly, and formed a whitish thickened mass, enclosing the infiltrated cells of the vitreous body, but presenting apertures of communication at various points. The lens was transparent; the iris was adherent to the capsule. Some blood was effused in the anterior chamber, with some traces of lymph. *Left eye*: The cellular tissue around this eye was also indurated, infiltrated with serum, and closely adherent to the sclerotica, which was much thickened, especially at the entrance of the optic nerve. The choroid adhered firmly to the inner

surface of the sclerotica. Very little fluid was found interposed between the choroid and retina. On turning back the choroid, the retina, hyaloid membrane, and vitreous body were found united into a firm yellowish mass, having much the appearance of coagulable lymph, and with scarcely any traces of purulent matter. The ciliary body was of a dark red colour; the lens and its capsule transparent; a slight effusion of blood in anterior chamber. Both lungs adhered at several points to the pleura costalis, but they were chiefly cellular adhesions. The left lung was collapsed to one-third of its ordinary size. A fibrinous concretion was found in the left ventricle of the heart, but not firmly adherent to its inner surface."

Here also evidence of inflammation of the veins is deficient. In one case there was well-marked erysipelas; in another typhoid fever; and in the third, fatal disease of the brain, but no phlebitis, is demonstrated. Mr. W. Bowman, in the *London Medical Gazette*, for October, 1846, says:

"Early in August I assumed the care of a young man whose leg had been amputated about ten days previously, on account of disease of the ankle and tarsus. The case was going on unfavourably: there had been a shivering fit on the fifth day from the amputation, followed by decisive symptoms of inflammation of the veins of the stump, advancing even above the groin. He was already in a state of high irritative fever, with a sallow and exhausted countenance; and on the 5th he was attacked with diarrhœa, which required starch and opiate enemata, with small doses of gray powder and Dover's powder. This symptom soon ceased, but bed-sores were appearing, and he had repeated rigors, with parched tongue, very rapid pulse, a hot skin, and an anxious and sunken look, which indicated serious internal disease. The stump itself was meanwhile assum-

ing a more healthy action, and the ligatures had separated ; yet there was some projection of the bone in spite of our efforts to prevent it. On the morning of the 6th he complained of his left eye smarting and aching, and it appeared to be affected with slight catarrhal ophthalmia. There was superficial redness, with mucous discharge. Alum lotion was applied. On the following day the inflammation had increased with frightful rapidity ; there was excessive florid chemosis, partly concealing the cornea ; the lids were turgid, and the eye wanted none of the characters of a severe attack of purulent ophthalmia, except the purulent discharge. The pain in the globe was of an aching darting kind. The cornea remained clear, but the aqueous humour and iris were muddy, and sight was totally lost. The chemosed membrane was searified, and four leeches were applied, which had the effect of speedily reducing the scarlet colour of the conjunctiva to a pale yellowish-pink tint, and the chemosis became of that sort which is known as "serous." This speedy change was accelerated by his weakened state, and showed that active depletion was inadmissible. Fomentations were then applied. The general treatment was continued, with an opiate at bedtime. On the 8th, dull pain in the eye continued, and the chemosis had increased and projected between the lids, but was pale and serous. The cornea had become cloudy, the chambers were yellowish, the iris obscured by lymph, the pupil occupied by a yellow mass of lymph, which looked like an opaque lens. The lids had become less œdematous, so that the condition of the interior of the organ could be more exactly noted. Meanwhile the local symptoms of phlebitis in the stump were on the decline, and the stump assumed a more healthy aspect, the bones still protruding slightly. But the rigors now re-occurred daily, with considerable regularity, attended with much exhaustion ; and about the 15th he was seized with

pleurisy of the right side, for which he was blistered, and took a grain of calomel with opium every four hours for two days. At the end of this period the pain in the side had nearly subsided, and (what is interesting) the lymph was absorbed from the iris and the pupil, which resumed very nearly their natural appearance, the latter only remaining rather turbid. He had lost almost all pain in the organ, and the morbid action within it seemed entirely checked. Some pale chemosis remained, but the cornea was clear, and the globe wore no appearance of internal suppuration. All pain in the organ had likewise ceased. On the 20th he died, after an aggravation of the symptoms betokening internal phlebitic abscesses. I examined the eye before twenty-four hours had elapsed, and had appointed an hour for the inspection of the rest of the body; but this was unfortunately prevented by the interference of the friends. The *iris*, seen through the transparent cornea, was clear green, without lymph on its surface, but firmly adherent by its entire posterior surface to the capsule of the lens, which presented only a partial opacity near its centre. This posterior synechia and opacity of the capsule appeared of old standing (and the patient had stated that this eye had been a poor one, and vision imperfect with it for many years). The *lens* itself was *perfectly transparent*. Under one of the recti, immediately behind its insertion, the sclerotic (and also the choroid) was much bulged, and so distended as to be almost giving way, evidently by pressure from within. It formed what would have been termed, from its shape and circumscribed figure, a staphyloma scleroticæ. In order to ascertain its nature, I carefully cut all round it through the sclerotica only, and in detaching this coat I found that it was extremely thin, and its fibres as it were unravelled, at the apex, where also the choroid was adherent to it by a film of recent lymph, and like the sclerotica, distended from within. The outer

surface of the choroid was perfectly natural, except at the apex of the swelling. On now cutting through the choroid, a whey-like fluid, with particles of lymph floating in it, escaped in abundance. I emptied the cavity between the choroid and retina, in which this effusion had collected, by syringing it under water, and the inner surface of the choroid then exhibited a coating of yellow lymph. The vitreous humour, in its enveloping hyaloid membrane, together with the broken remains of the retina, had been thrown by the effusion to the central part of the globe, where they occupied only about half their natural space. The retina was not at all coated with lymph, and its capillary network was perfect, but the nervous substance was in a great measure destroyed, as though macerated; yet what remained exhibited the characteristic elements of the nervous substance of that part. In particular, I discovered several well-marked examples of the caudate nerve-vesicles, which I had never before unequivocally seen in that membrane, although strongly suspecting their existence. Jacob's membrane was no where visible."

In this case, also, the phlebitis, although its existence was probable, was not positively proved. But whatever doubts we may entertain as to the coëxistence of phlebitis and ophthalmia, or of the one being the cause of the other, there seems to be none respecting the occurrence of inflammation of the eyes during the puerperal period when uterine phlebitis takes place; so much so that the one fact must be accepted as strong evidence in favour of the other. The following cases recorded by Dr. Marshall Hall and Mr. Higginbottom in the thirteenth volume of the *Medico-Chirurgical Transactions* afford valuable examples:—

"CASE 1.—Mrs. A., æt. 23, of a delicate constitution, was delivered after a natural labour, on the 27th of October,

1823. Before the time of her confinement she was affected with continued diarrhœa, for which she took occasionally a dose of rhubarb. On the ninth day after delivery, an affection of the left eye was first observed; red vessels were seen proceeding across the conjunctiva, and converging towards the cornea; the pupils were extremely contracted, and there was great intolerance of light. On the succeeding day the course of the enlarged vessels was completely obscured by great tumefaction of the tunica conjunctiva; the transparency of the cornea was somewhat lost, the pupil enlarged; the pulse was very frequent. On the third day of this disease the chemosis, or tumefaction of the conjunctiva, was greatly augmented. Large red vessels were observed passing in all directions; the cornea was still more opaque, uneven on its surface, covered with a film of mucus, sunk in the chemosis, and surrounded by a ring of ulceration about a line in breadth, and covered with white pus. The pupil was still more enlarged, but seen obscurely through the opaque cornea; there was still intolerance of light; and the vision was very imperfect. The eyelids were greatly swollen, partly perhaps from the application of leeches; the pulse 144. On the fourth day the eye was nearly in the same state; the pulse was only 120, and the patient expressed herself as feeling much better. On the morning of the fifth day the pulse was 100, in the evening 120. During the night there had been slight delirium; the chemosis was less, the ulceration round the cornea greater, the cornea more opaque, uneven in surface, and irregular in form; the pupil could not be distinguished. A little pus was observed in the lowest part of the anterior chamber; there was less appearance of mucus over the eye. On examining the eye in the gentlest manner on the sixth day, the cornea gave way, and the aqueous humour and crystalline lens escaped and flowed down the cheek. The chemosis now subsided, and the remaining portion of the

cornea collapsed. In a day or two afterwards chemosis increased, and there occurred great pain, redness, and tumefaction, and complete closure of the eyelids. This again subsided, and when the eyelids could be separated, the eyeball appeared of a brownish hue, the space previously occupied by the cornea presenting the appearance of a white ulcer. In the course of a week or two the swelling totally subsided, the conjunctiva became white, and the ulcer healed. About the second day of this affection of the eye, the wrist and arms became affected in five distinct points by a diffused redness and great tenderness. In the course of a few days suppuration took place, and each part required to be opened by the lancet. Afterwards most copious suppurations took place in the integuments in different parts of the surface of the body, along the thigh and legs, in the axilla, and above the clavicle. These suppurations eventually exhausted the patient, and she died in a state of extreme feebleness and emaciation. This patient took opium for the diarrhœa, was bled, and took mercury in the beginning of the affection of the eye, and afterwards had cinchona and wine.

“CASE 2.—Mrs. B., æt. 27, of the sanguineous temperament, was delivered after an easy labour, and without much hæmorrhage, on the 13th of November, 1823. On the second day after delivery, she became affected with fever and derangement of the bowels, which continued but with varying degrees of severity until the eleventh, on the morning of which day a slight redness of the left eye was observed, occupying and being confined to the external canthus. At the same time a slight blush of redness was observed, first on the back of the right hand, and afterwards along the ulna. In the evening the eye was affected with slight chemosis, the conjunctiva protruding in a loose flabby state, and with scarcely any redness. On the succeeding morning all the morbid appearances were aug-

mented ; the chemosis was extensive, but the conjunctiva was loose, flabby, and pale rather than red ; the cornea was clear, but covered with a slight film of mucus ; there was no appearance of ulceration at the junction of the cornea with the tunica conjunctiva ; the eyelid was very slightly swollen ; the pupil not contracted. The inflamed parts of the hand and arm were extremely red and painful, with perhaps a slight fluctuation over the ulna. There was also a little redness and swelling on the outer side of the right ankle, perhaps arising from pressure. The patient was at this time evidently in a sinking state, and did not survive long. It will be plain, on contrasting this case with the preceding and succeeding ones, that the disease of the eye was arrested in its progress by the failure of the energies of the constitution. The remedies employed were principally purgative medicines, calomel, and the spiritus terebinthinæ, in full and repeated doses.

“ CASE 3.—Mrs. C., æt. 30, and delicate, was delivered on the 20th January, 1821, after a tedious labour, during which it was deemed necessary to take away fourteen ounces of blood, in consequence of rigidity of the os uteri. On the morning of the 21st, she was seized with much shivering, followed by great heat, sickness, and frequency of the pulse. An injection and opening medicine evacuated much hardened fœces, and afforded great relief. In the evening, however, there was great heat, restlessness, slight delirium, and headache, with faintishness on attempting to sit erect. On the 22nd and 23rd, the symptoms were much the same, but on the latter day there appeared some inflammation in the course of the vein from which she had been bled. On the 24th, 25th, and 26th, the general symptoms were less severe, but the inflammation pursued its course along the vein. On the morning of the 27th, the eighth day from delivery, there appeared slight inflammation of the left eye, which increased during the day. The inflam-

mation of the vein increased rapidly, being attended by pain, tenderness on pressure, swelling, and a watery discharge from the punctured orifice. Amongst other remedies calomel and opium were given every three hours, and ice was applied locally. On the 28th, the conjunctiva was much tumefied, and the cornea somewhat opaque. On the 29th, the cornea was still more opaque and sunk in the swollen conjunctiva. On the 30th, the eye appeared to have burst, the cornea being still more sunk and shrivelled; the arm and axilla were much swollen; the patient was evidently sinking, and she died in the night. No examination of the body could be obtained.

“CASE 4.—Mrs. D., æt. 40, deformed, habitually weak, and subject to dyspnœa on any exertion. She was the mother of several children, and had suffered much in every pregnancy from increased difficulty of breathing (being obliged to raise herself upright in bed, to prevent a sense of suffocation), and from œdematous swelling of the legs. Her nights were generally restless, and she was in the habit of taking the black drop to procure repose. On the 15th of November, 1822, she was delivered of her fourth child, after a difficult labour, requiring the use of instruments, and attended by considerable hæmorrhage. Her delivery was followed by great exhaustion and great frequency of the pulse, but did not occasion syncope. On the 17th, she complained of much heat, and of pain of the head with noise in the ears, and the pulse was very frequent. Purgative medicine and an enema were prescribed, an anodyne draught was directed after the bowels should be well opened, and a liniment was applied to the abdomen. From the 18th to the 22nd, the symptoms were nearly the same; heat of surface, frequency of the pulse, violent pain of the head, and sometimes slight delirium. On the evening of this last day she ate two eggs and took some wine, contrary to a strict injunction. On the 23rd, the eighth day after deli-

very, she began to complain of pain of the eye, and on examination the conjunctiva was found inflamed, and there was a constant flow of tears; there was more delirium and more pain of the legs. On the 24th, the conjunctiva was swollen, the pupil enlarged, and the cornea somewhat opaque. On the legs several streaks of redness were observed, attended by much sensibility and pain. She complained much of the head, and the pulse was 150 or 160. On the 25th, the conjunctiva was still more humid, the cornea more opaque and apparently sank; the vital powers were evidently sinking fast, and the fatal event occurred in the evening, on the third day of the affection of the eye.

“CASE 5.—Since the preceding cases were transmitted to the society, we have been called to witness the course of a fifth example of this fatal malady: and as it differed from the rest by a still more early sinking of the vital powers, and consequently by a less marked form, we think it right to append it to them:—Mrs. E., aged 22, was delivered after a rather lingering labour of sixteen hours’ duration, on Wednesday night, the 25th May, 1825. The succeeding day was passed without any symptom of complaint; but the patient had exerted herself far too much in seeing visitors, and care of the infant. Early on the Friday morning she was taken with shivering, which was followed by profuse perspiration and a rapid pulse. The bowels were freely moved, and were in the most healthy state, having been particularly attended to during the whole of her pregnancy. The perspiration gradually subsided, but on Saturday morning the pulse still remained at 120, and the abdomen was rather full, and painful, and tender under pressure, on the right side. These appearances of abdominal affection were, however, entirely subdued by the application of leeches, and by again evacuating the bowels. In the evening, and on Sunday morning, there was no tenderness or fulness of the abdomen at all, but the pulse

remained frequent, though less so than on the preceding day. In the evening of Sunday the pulse became more frequent, and the abdomen again tumid, and two red tender spots appeared in the inside and fleshy part of the left forearm. Very early on the Monday morning the pulse was found to be still more frequent, and the abdomen more tumid, while the vital powers were evidently failing. The bowels had been evacuated during the night freely and without uneasiness by the spiritus terebinthinæ. The arm remained as before. About eleven o'clock a.m. the left eye was observed to be inflamed, and the tunica conjunctiva to be red and tumid. The state of sinking increased rapidly, and the patient expired at one."

Dr. Lee, in the twenty-eighth volume of the Transactions of the same Society, records the following cases:—

"Ten weeks after delivery, and six after the commencement of uterine and crural phlebitis, the conjunctiva of the right eye suddenly became so much swollen and inflamed that the eyelids could not be closed, and a copious secretion of an opaque fluid took place from their inner surface. The cornea soon became opaque, and the vision was entirely lost two weeks before death. There was little pain or intolerance of light. The left eye became similarly affected, without much pain, and both were so much swollen that they appeared to protrude from the orbits. The vena cava, internal and external iliae, and femoral veins, had all undergone the usual changes of structure which result from acute inflammation. In a patient of the British Lying-in Hospital, delivered on the 27th January, 1832, obscure febrile symptoms took place, a few days after, without any pain in the region of the uterus. On the tenth day after delivery there was fever, with delirium, tremors of the muscles, and a peculiar dusky sallow com-

plexion; the whole of the left lower extremity was swollen, hot, tense, and shining, and there was exquisite pain on pressure along the course of the iliac vessels on the left side, and down the inner part of the thigh. The conjunctivæ of both eyes suddenly became intensely red and swollen, and the sight was much impaired, if not entirely lost. The right knee-joint became exquisitely painful, and a gangrenous spot appeared over the sacrum. Before death, which took place on the 18th February, the eyes had become enormously swollen, so that the eyelids could not be closed, and the vision was completely gone. The coats of the left common external iliac and femoral veins, deep and superficial, were all thickened, and their cavities plugged up with firm coagula. The same was the case with the epigastric vein, and circumflexa ilii. The glands in the vicinity of these veins were enlarged, red, and vascular, and closely adherent to the cellular membrane, and outer surface of the vessels. The vena cava, to a short distance above the entrance of the left common iliac vein, had its coats thickened, and a soft coagulum of lymph adhering to its inner surface. The uterine, vaginal, gluteal, and most of the other veins which form the left internal iliac, were gorged with pus, and lined with false membranes of a dark colour. The uterine branches of the right internal iliac vein were also filled with pus and lymph, but the inflammation had not extended beyond the entrance of the trunk of this vessel into the common iliac, and the right common and external iliac and femoral veins were all in a healthy condition. In the muscular coat of the cervix uteri, on the left side, was a cavity which contained about half an ounce of purulent fluid. The veins proceeding from this part of the cervix were filled with pus. On the 10th of October, 1844, Mrs. G—— was delivered with the forceps, after having been upwards of forty-eight hours in labour with her first child. For several days she ap-

peared to be recovering in a satisfactory manner, when slight hæmorrhage from the uterus took place, with fever and constant difficulty of breathing. On the 6th of November, the dyspnœa and quickness of pulse having gradually increased without any pain in the region of the uterus, the vision of the right eye was suddenly lost. On the 7th, there was no intolerance of light, nor appearance of inflammation of the iris or conjunctiva. On examining the eye on the 8th, I found the iris covered with lymph, and there was a great effusion of clear serum under the conjunctiva, which was so much swollen that the eyelids could not be closed. The power of seeing with this eye was totally destroyed. There was severe pain in the right shoulder-joint, and in the right hand and fingers, which were stiff and swollen. The whole of the left lower extremity was affected with the swelling and other symptoms observed in phlegmasia dolens, and there were two large purple spots on the inner part of the left leg. On the 9th, there was no headache or delirium. The pulse was 130, and feeble, and there was much dyspnœa, without cough or expectoration. The pain continued in the right shoulder-joint, and the swelling and stiffness in the hand and fingers. The left lower extremity was swollen, hot, and colourless; and several more large dark purple spots, or blotches, had appeared over the inside of the leg, and one, the size of a crown-piece, over the right trochanter. There was no pain nor tension in the hypogastrium, or along the course of the iliac and femoral veins of the left side. The eye was in the same state. On the 10th, the head was still perfectly clear, and there were no tremors or nervous symptoms of any kind. The conjunctiva of the right eye was red, the effusion of serum under it still greater, the iris was covered with lymph, and the bottom of the anterior chamber filled with it. There was merely a sense of stiffness experienced in the eye. Vision of the left eye

was indistinct, the iris movable, and of a gray colour. Wine, ammonia, and beef-tea were given freely, without much benefit. On the 12th, the tongue was dry, and the pulse so rapid and feeble, that it could not be counted. Great prostration of strength and profuse perspiration took place, and a large gangrenous spot appeared over the sacrum; the swelling of the right hand had disappeared, the dyspnœa had increased, and there was occasional delirium. She died on the 16th, and I examined the body the following day. There was no trace of inflammation in any part of the peritoneal sac. The left internal iliac vein through its whole course was lined with a thin, false membrane, which closely adhered to the inner surface of the vessel, and near the uterus its cavity was filled with pus. All the veins on the left side of the os and cervix uteri, and those of the vagina, were inflamed and full of purulent fluid. The coats of the left common iliac vein were thickened, and its cavity filled with a soft, pultaceous mass, the outer surface of which firmly adhered to the vein. A coagulum of blood, three inches in length, was contained in the lower part of the vena cava, which had not been inflamed. The left common iliac vein, the superficial and deep femoral, and the saphena veins, were all filled with firm coagula of blood, but the coats of none of these vessels presented the alterations of structure usually observed after phlebitis. The cellular membrane of the whole of the left lower extremity was filled with serum."

Whatever may be the views entertained respecting the nature of the inflammation of the eye in these cases, or whatever doubts may be entertained respecting its connexion with inflammation of the veins, there can be no question as to its forming part of a disease pervading the entire system. A state of constitutional disturbance of the most formidable description follows inoculation with

an animal poison, a wound of a vein, or a simple injury ; or it arises during the puerperal period, or in the progress of typhus fever, and is characterized by the occurrence of destructive local inflammations. From this general tendency, the eye is not exempted, and hence these examples. Being, however, thus a part only of a more general disease, little can be expected from local treatment of the affected organ, except such relief as soothing applications, or giving exit to matter can afford. The only means of arresting the progress of the destructive process are brought into operation through the system at large, but such is the rapidity of its advance, or the peculiarity of its nature, that sufficient time to exercise influence in this way is seldom gained. From the preceding narratives it, in fact, appears that the inflammation of the eye is but a secondary consideration, the fatal result of the disease being imminent even at its commencement ; and under such circumstances the general treatment is the only ground of reliance. A detail of the measures to be adopted in this general treatment would be misplaced here ; it is sufficient to observe, that the fever being of the low and typhoid character, and the local inflammation being of that kind which ends in destruction of the organ, by the effusion of serum, pus, and lymph, every means calculated to support life until this constitutional disease can be removed, must be employed.

ON NEURALGIC INFLAMMATION OF THE EYE.

THE necessity of considering a species or variety of inflammation of the eye distinguished by characters which entitle it to be named neuralgic may be questioned, but I think on inquiry it will be found to exist. It may be urged that any of the preceding forms of inflammation noticed by me may be accompanied by such pain and other symptoms as would justify the application of the term neuralgic to them, but that this should not be considered a ground for establishing a distinct species of disease: I think, however, that the causes, symptoms, progress, and effects of the inflammation to be now described are so peculiar and characteristic that it cannot be considered a mere variety or modification of some other species. It is not possible to investigate here the nature of the disease to which the term *neuralgia* is applied, all that can be effected by the present inquiry is to ascertain its nature when this particular organ is attacked. When neuralgia of the usual form arises from inflammation of the fifth pair of nerves, or of its ophthalmic branch, the eye is often the seat of the pain and inflammatory action; and often, when the eye is inflamed from the usual causes, the inflammation appears to be propagated from it to the nerve and its branches. It may be difficult to prove that the disease, whatever it is, which causes neuralgia, causes inflammation also; but there is nothing contrary to fact or reasoning in the assumption that it does so. In neuralgia of the usual form affecting the ophthalmic nerve or some of its branches, the eye becomes red during the paroxysm, and at the same time tears flow, and vision is more or less impaired. This, I admit, may not be considered true inflammatory action, but it is

so like it that the occurrence of real inflammation from the same cause is rendered probable. The nervous origin, in fact, of certain inflammations of the eye, is not to be denied from any assumed impossibility of such a result, and from my own experience I am inclined to believe in its existence: neither is there any great difficulty in admitting that simple inflammation of the organ may extend to the nerve or the branch of nerve which supplies it, and so may cause neuralgia. It may be difficult to explain why inflammation is sometimes accompanied by pain as intense and peculiar as that which takes place without any inflammation, and which is called *neuralgia*; while at other times, or in other cases, inflammation is unaccompanied by any pain: but the fact cannot be denied, and it is established by observation in the treatment of inflammation of the eye in particular, as I have now to show. The inquiry respecting the occurrence of neuralgia from inflammation of an organ, and of inflammation from neuralgia, must not, however, be confined to the case of the eye, it must extend to other cases. Toothache takes place from exposure of the nerve in caries of a tooth, and without any inflammation, while pain of the same character attends inflammation of the membrane interposed between the fang and alveolar socket without any caries. The intermitting neuralgia which takes place in the brow, and is hence sometimes called brow ague, is undoubtedly in some cases accompanied by or caused by unequivocal inflammation of the membrane lining the frontal sinus, while in other cases no such inflammation can be detected. These considerations, however, are more applicable to the investigation of neuralgia in general, and have been entertained more or less by writers on that subject; here they must be restricted to disease of a single organ.

Neuralgic inflammation of the eye appears to me to take place in two distinct forms; one, in which the disease ex-

tends from the nerve to the eye ; the other, in which it extends from the eye to the nerve. In that form in which the disease extends from the nerve to the eye, the symptoms are those of common neuralgia ; returning at long intervals, and when established, continuing for a longer or shorter period with regular intermissions. The patient is attacked with severe pain of the brow, temple, and orbit ; extending to the eyeball, and of a distressing or even agonizing nature : not the continuous unremitting pain of common inflammation, which is probably caused by distension, but varying every moment in intensity ; and rising into excruciating pangs, or subsiding into comparative ease. At the same time vision is impaired, luminous spectra or flashes of light appear, and the sclerotic becomes conspicuously red, while tears flow abundantly, with distressing intolerance of light. This generally continues for some hours and then subsides, leaving the patient free from all the symptoms until the following day, when it returns about the same time, and pursues a similar course, assuming a distinct intermitting character. The paroxysms and intermissions are not, however, so regular and distinct as those of the neuralgic inflammation of the membrane of the frontal sinuses called brow *ague*, but differing as to period of occurrence, and continuance each day ; lasting sometimes for a few hours only, sometimes for the greater part of the day. These daily exacerbations and remissions generally continue for a week or ten days, or even for a fortnight or three weeks, when they cease, either spontaneously or under the influence of active remedies ; leaving the organ uninjured and vision unimpaired. Such attacks are generally attributed to some undefined derangement of the constitution or system at large, and not to the causes which usually produce inflammation, such as exposure to wet or cold ; and are supposed to depend upon some functional disturbance or derangement arising from sympathy with a

remote organ. I think, however, the practitioner may with safety assume that there is in this case no particular deviation from the usual course of disease, and that the complaint is a local inflammation caused by the impressions which commonly produce such effect. The recurrence of the disease, at longer or shorter intervals, its intermissions when established, and the low amount of inflammatory action, afford no valid objection to such an inference. Inflammation appears in so many forms, modifications, and peculiar shapes, that its occurrence in this way need not surprise us. It must not, however, be forgotten, that if the disease is inflammatory, it is modified by some peculiar state of the system or constitution ; that in fact it takes place from an external impression operating on a particular condition of the body, and that the treatment of it must be adjusted accordingly.

To relieve or remove the disease which I have been endeavouring to describe, whether considered of true inflammatory nature or not, the depletion and other active antiphlogistic remedies required in common inflammation are not demanded. The first indication to be met is that of the derangement of the constitutional health. This may arise from impaired function of some particular organ, and especially of the stomach, liver, or kidneys ; and in the female, of the uterus, which must, if possible, be repaired : or it may arise from defect in the process of nutrition or the presence of a rheumatic diathesis, which must also be corrected. The next object to be achieved is the alleviation of the local inflammatory action and pain. It would be superfluous here to dwell upon the numberless resources available for the restoration of general health in cases of this kind ; every educated practitioner is aware of them, and has his own favourite methods of treatment. The local organic derangement, if any, which causes the general disturbance of the system at large, must be discovered if possible ; and with this view, the state of the liver, kidneys,

uterus, skin, and above all, the stomach, investigated. Small doses of calomel combined with purgatives, rendered mild in their action by sedatives, such as the compound colocynth pill with hyoscyamus, may be given at night with the hope of stimulating the liver to a more healthy secretion, removing gently the contents of the small intestine, and perhaps improving the secretions from the mucous membrane. Rough purging, unless resorted to in some vigorous patient as a special remedy, as emetics may be, should not be permitted. If derangement of the stomach be indicated by the state of the tongue, acrid or acid eructations, heartburn, flatulence, and general uneasiness; and accompanied by deposition of lithates in the urine, antacids, moderate stimulants, bitters and aromatics must be administered. Infusion of quassia, gentian, cascarilla, or calumba, according to the taste of the practitioner and patient, with some warm aromatic tincture, and a little bicarbonate of potass and aromatic spirit of ammonia, may be given in the morning and midday. Diet, exercise, air, and climate, must receive due consideration, and present pursuits and habits must, if objectionable, be reformed. Should these measures fail, what may be called specific remedies must be employed, such as bark and iron; but as I have already alluded to these remedies in treating of the other forms of inflammation of the eyeball, and as the complaint in question partakes so much of the mere neuralgic character, I must refer to writers on that subject for more copious details. The local treatment should consist of sedative and stimulant applications to the skin, with perhaps the addition of leeching, where the inflammatory action is conspicuous. Sedative stupes and liniments, rubefacients, sinapisms and blisters will be put in requisition, and if pain be very severe, the preparations of belladonna, or more correctly, of the atropa belladonna, must be employed both internally and externally.

Having thus briefly alluded to the form of neuralgic inflammation, which I venture to suggest may be considered an extension of inflammation or other disease of the nerve to the eye, I have now to direct attention to that form which may be considered to depend upon an extension of the inflammatory action in a diseased eye to the nerve. Before entering on this inquiry, it should be recollected that inflammation may take place with little or no pain, notwithstanding a prevalent belief to the contrary. It seems to be universally assumed that when the eye is inflamed, pain and intolerance of light must be present, yet every practitioner must have observed that often no such effect follows. In syphilitic inflammation especially, intense disorganizing inflammation may exist with little more uneasiness than is necessarily caused by vascular turgescence and altered conjunctival surface. Pain, however, does generally attend inflammation of the eye, but it is the pain caused by distension or motion, as in other parts of the body, and is very different in its nature and result from that which is now to be noticed. In certain forms of inflammation of the eye, the pain is evidently disproportioned to the amount of inflammatory action, resembles more the agony of toothache, and takes place more in pangs or paroxysms. It also has regular periods of intermission, or irregular remissions, and is exasperated by light. At the same time the eye becomes intensely red, vision is nearly lost, and luminous spectra, with scalding lachrymation, add to the patient's sufferings. This form of inflammation, which I venture to call neuralgic, does not, I think, ever occur as a first attack; it is the form which is met in cases of frequent relapse or of long continuance. Persons once attacked by severe inflammation of the eyeball, of any species, are liable to returns of the same on exposure to cold or any other exciting cause, and it is after several returns of this kind that the inflammation assumes the character of

describe. In some cases also the inflammatory action does not subside, notwithstanding the most active treatment, but becomes protracted or chronic; and it is under such circumstances that these symptoms arise. It may be met with where the primary or original disease was simple idiopathic inflammation, or even where it was syphilitic, and in the latter case it is often treated as if it depended upon the specific disease. Such also appears to be the character of the protracted inflammation which so frequently follows operations for cataract with the needle through the sclerotic instead of the cornea, and which for this reason, as well as for others, may be considered disgraceful to surgery. The amount of disorganization caused by this species of inflammation does not appear to be in proportion to the severity of the symptoms. I have often been astonished to find an eye which for three weeks or a month had been intensely red, with severe intermitting pain, intolerance of light, scalding lachrymation and alarming defect of vision, little injured after the inflammation had subsided. Persons who see such cases for the first time are often greatly alarmed at the appearance they present. The sclerotic vascularity, change of colour in the iris, irregularity and adhesions of the pupil, and opacities of the capsule of the lens, are so conspicuous that it is difficult to arrive at the conclusion that these changes are not due to the existing inflammation; yet much of them are but the consequences of previous attacks, and in many cases have taken place in the first, and before the disease assumed the character described. I have often been astonished to observe the amount of useful sight which remains after repeated returns of this disease. I know one gentleman who has had about twenty-five attacks in about ten or twelve years, yet he is able to attend to his business, and even to read and write, although with some difficulty, notwithstanding extensive adhesions of the pupil and opacity of the capsule.

The treatment of this complicated inflammation must be adapted to its peculiarities. It is not to be subdued by the usual simple measures relied on in the common forms of inflammatory action. Depletion and mercury will not afford relief, but on the contrary, sometimes appear to exasperate the disease. The characteristic pain and intermitting symptoms suggest rather the administration of sedatives and tonics than debilitating remedies. Bark and iron, opium, hyoseyamus, and belladonna are indicated by the symptoms, more than bleeding, purging, or antimonials. Still, keeping in view the inflammatory nature of the disease, and the vast importance of the organ at stake, the practitioner will not feel inclined to take the responsibility of rejecting the usual means relied on to arrest inflammation in its commencement, and I believe he may, if not with advantage, at least with safety, commence by the application of ten or a dozen leeches to the temple. Abstraction of blood in this way seems to effect something different from mere depletion, and is sometimes followed by at least temporary relief. Mercury also, if the inflammatory action be considerable, may be employed; although, as I have already said, without any certainty of advantage. It is a remedy upon which the surgeon cannot well fall back in the more advanced stages of the disease, and if administered, should therefore be given at the commencement. Its use will not prevent the subsequent resort to tonics and sedatives, or even their adoption at the same time. As in other cases, the *pilula hydrargyri* combined with the *pulvis ipecacuanhæ comp.* and tartrate of antimony may be given in moderate doses three times a day, and subsequently continued at night only, while other remedies are added during the day. When, however, the attack is but a repetition of others which have frequently taken place before, and especially in cases where mercury has been already tried without benefit, the trial should not be

repeated. In cases which are relapses or repetitions of numerous other attacks, perhaps the sooner recourse is had to tonics, and especially to bark or iron, or to both in combination, the better. Preparation, however, should be made for their administration by gentle purgatives, followed by some suitable bitter infusion, combined with antacids and aromatics. Decoction of bark with some tincture, may be found as convenient a preparation of cinchona as any other, and the saccharated carbonate of iron as good a form for the administration of the iron. I have, however, in preceding chapters, so often alluded to the method of administering these and other remedies, that it is unnecessary to dwell upon the subject here. Food should be nutritious and easy of digestion, avoiding those fluid farinaceous or starch preparations and broths, which are so often provided for invalids.

Since the above was written, I have seen a communication from Dr. Hays of Philadelphia, in the *American Journal of Medical Science*, which affords some illustration of the above observations. It contains an account of three or four cases of "exalted sensibility" of the retina from disease affecting the teeth. In one, pressure on the lateral incisor causing pain, that tooth was extracted; after which the intolerance of light, previously most distressing, and a "disagreeable gnawing or pinching sensation at the back of the eye" ceased. An abscess was found at the point of the fang. When Dr. Hays saw him there was "scarcely a trace of inflammation of the eyes," but at the commencement of the attack there was "some inflammation of the conjunctiva." In another case, a gentleman "who had suffered two years previously from a slight attack of iritis," upon recovery, "experienced, when he attempted to read, a peculiar uncasiness in his eyes." After the extraction of a tooth, at the root of which an abscess was found, he

was entirely relieved, and has since continued perfectly well. In a third case, a young lady, "subject to frequent severe attacks of inflammation of the eyes," with "excessive intolerance of light," was greatly relieved by the extraction of some decayed teeth. Dr. Hays, with good reason I think, considers that these affections of the eye arose from the "irritation of the dental branch of the fifth pair of nerves," and I cannot avoid coming to the conclusion that they were inflammatory. In all, there had been at one period or another inflammation of the eyes or conjunctiva, and if the intolerance of light depended on the disease of the teeth, it is probable that the inflammatory action arose from the same cause.

I here bring to a conclusion these inquiries respecting the Inflammations of the Eyeball. They embrace some of the most important diseases of this organ, and bring together facts and results calculated to instruct by comparison. I am convinced that the subject is one not only of importance, as regards the inestimable sense of sight, but as affording most valuable illustrations of disease in general.

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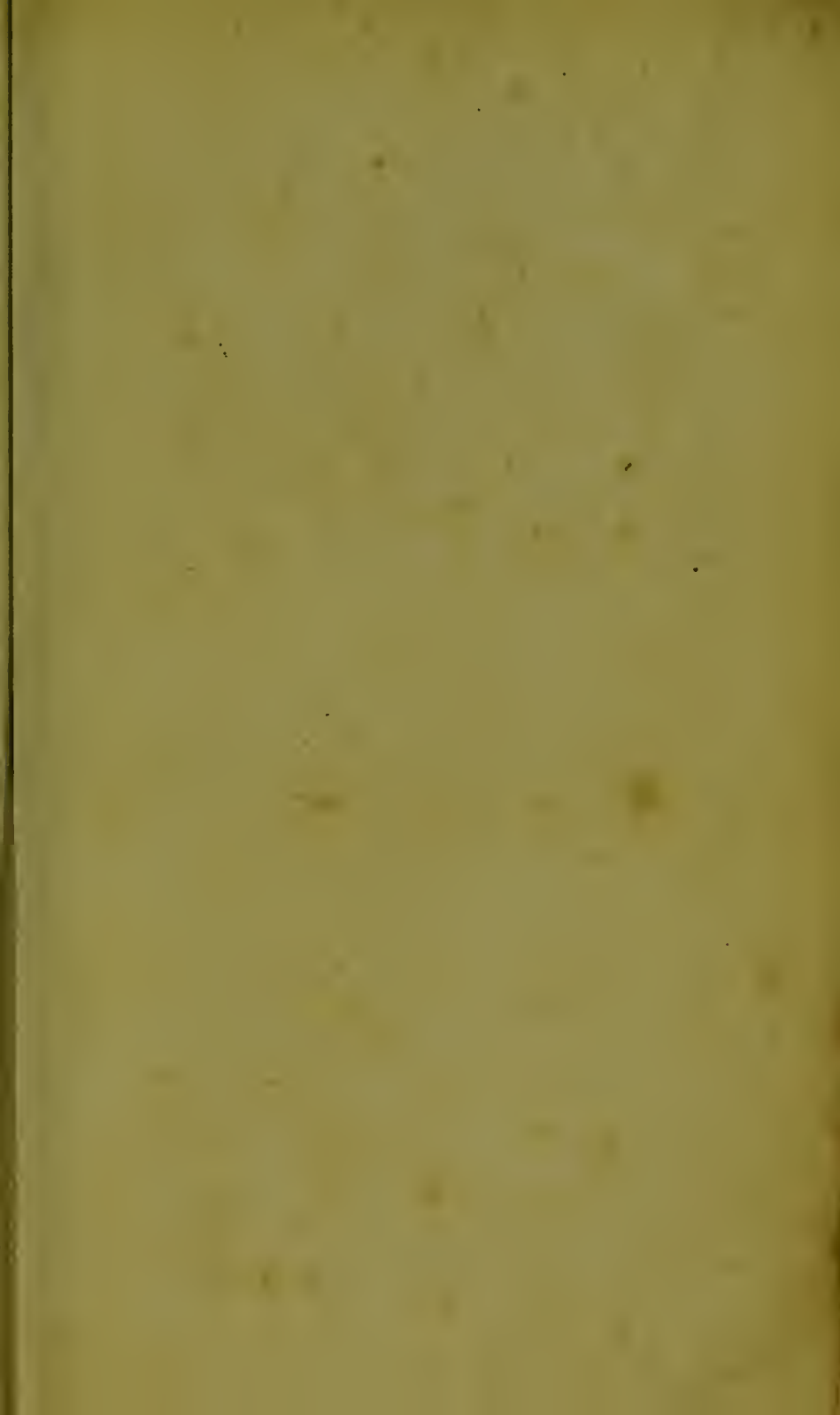
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